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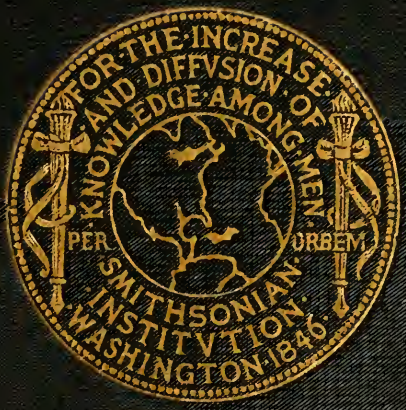

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MAP OF SANTO DOMINGO

SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM
Bulletin 147

ARCHEOLOGICAL AND HISTORICAL INVESTIGATIONS IN SAMANÁ DOMINICAN REPUBLIC

BY

HERBERT W. KRIEGER

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The present work forms No. 147 of the *Bulletin* series.

ALEXANDER WETMORE,
Assistant Secretary, Smithsonian Institution.

WASHINGTON, D. C., June, 1929.

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ARCHEOLOGICAL AND HISTORICAL INVESTIGATIONS IN SAMANÁ, DOMINICAN REPUBLIC

By Herbert W. Krieger

Curator of Ethnology, United States National Museum

HISTORY OF THE MUSEUM EXPEDITION TO SAMANÁ, 1928

The northeastern portion of the Dominican Republic, comprising the peninsula and bay of Samaná, with its many islets, has long been known as a region rich in deposits left by its pre-Columbian inhabitants. On the south shore of Samaná Bay, which deeply indents this coast of the island, William M. Gabb explored some caves in 1869–1871 and found them to contain very extensive kitchen middens. Pottery and bones collected by him have been in the National Museum since 1872. Among these bones were found, early in 1916, by Gerrit S. Miller, jr., of the National Museum, some jaws of a rodent supposed at that time to be extinct. Stimulated by this discovery, Dr. William L. Abbott visited the caves later in the same year. He obtained material of great interest and reported that large accumulations of shells, bones, and pottery remained to be examined. Doctor Abbott's earliest expedition to Santo Domingo was in 1883 and repeated visits were made by him since that time.[1]

Exploration of the caves.—With the chief object of working these deposits more carefully than had hithereto been done, the writer of this article and Gerrit S. Miller, jr., of the National Museum, spent several months during the winter and spring of 1928 in exploring the environs of Samaná Bay and of the peninsula which separates

[1] In the coastal region Doctor Abbott investigated numerous caves in search of an extinct mammalian fauna. Trips to several localities in the highlands of the interior were also made, notably to Constanza Valley and to the upper valley of the Jimenoa. On these expeditions he made very interesting collections of mammals, birds, reptiles, mollusks, insects, and Indian artifacts. His success in obtaining living jutias (*Plagiodontia hylaeum*), long supposed to have become extinct, has been scarcely less notable than his discovery of a form of crossbill (*Loxia megaplaga*) related to the white-winged crossbill, a species restricted in the breeding season to the Boreal zone of North America. Accounts of Doctor Abbott's work in Santo Domingo and Haiti have appeared from time to time in the Smithsonian Miscellaneous Collections, vol. 66, No. 12, and No. 17, pp. 36–39, 1917; vol. 72, No. 1, pp. 34–36, 1920; vol. 72, No. 6, pp. 43–47, 1921; vol. 72, No. 15, pp. 44–47, 1922; vol. 74, No. 5, pp. 62–63, 1923; vol. 76, No. 10, pp. 43–47, 1924; also in the Proceedings of the National Museum, vol. 72, No. 16, 1927, by Gerrit S. Miller, jr.

its northern shore from the Atlantic Ocean. The combined objectives of the expedition were to recover skeletal and cultural remains from shell heaps, kitchen middens, and aboriginal habitation sites, as well as to make general collections of the plants and vertebrates of the region.[2]

Working from the town of Santa Barbara de Samaná as a base, the expedition crossed to the caves on the south shore of Samaná Bay, where a month was spent in the caves of the Playa Honda coast. Living quarters were established in one of the larger caves locally known as "Boca del Infierno" (the mouth of hell). Except for the annoyance caused by the small sand flies, living in the caves was pleasant enough, as the cave floor was dry and the entire cavern well ventilated. Three main openings, two of which faced the sea, and several large openings in the roof caused by the fall of rock masses loosened by water seepage, were not sufficiently large to allow daylight to penetrate the entire cave. Recourse was had to artificial lighting, in which a combination of electric lanterns, flash lights, paraffin candles, kerosene lanterns, and candlewood torches played a part.

The cave selected as the expedition's headquarters had several compartments, one of which served as packing room and laboratory, others as dormitories. The laboratory also was used as kitchen and dining room. At mealtime the bottled lizards and the plant presses were removed from the packing-box table and were replaced by kidney beans, rice, fish, and Dominican coffee roasted to a crisp admixed with sugar, ground into a powder, and boiled indefinitely. The merits of Dominican coffee thus prepared may well be remembered if not appreciated.

Abraham Lewis, a St. Kitts negro long established near the town of Santa Barbara de Samaná, with his two helpers, one a native Dominican, the other a deep-water English sailor from Jamaica, operated the small sailboat chartered for the expedition. The desire to work for the Americans was so great that Abraham, in order to accommodate his friends, was compelled to change the crew each

[2] Acknowledgment is here made of the courteous treatment extended by officials of the Dominican Government to members of the expedition from the National Museum. The Secretaries Alfonseca and Ginebra, of the President's Cabinet, kindly outlined a plan of operation whereby the Dominican and the United States National Museums alike benefited from the collections made during the season's work. The live interest in historical problems shared by the high officials of the Dominican Government was a constant source of inspiration to the members of the expedition. As early as 1912 the superintendent of the Dominican National Museum, Señor Dr. N. Alberti y Bosch, published a treatise on the geology of Santo Domingo under the title "Apuntas para la Prehistoria de Quisqueya," La Vega, 1912. Valuable information was supplied by Doctor Alberti regarding location of desirable sites for future working; also regarding local conditions. Doctor Alberti's live interest in the problems involved will make future cooperation between the United States National Museum and the Dominican National Museum in the historico-archeological projects to be undertaken on the island desirable and doubtlessly mutually highly profitable.

week. This novel form of labor turnover proved somewhat annoying but gave the greatest satisfaction all round.

No fresh water was found in any of the caves explored, although a small quantity of water saturated with calcium carbonate dripped from the cave ceiling at several points. This water, because of its lime content, was not potable. Stalactites and stalagmites were readily formed. Apparently such water occasionally had been used by the aboriginal occupants of the caves, as shards of broken earthenware vessels and a few unbroken bowls were picked up from the cave floor near the stalactites. These shards were coated with calcium carbonate and frequently were not recognized as earthenware fragments until the lime incrustations were removed. Springs of fresh water at several places flowed from the base of cliffs in the narrow, eroded ravines of the mainland of the south shore. Here the aboriginal population of the caves obtained their supply of potable water.

A plentiful supply of edible fish was obtained by Abraham and his crew by sinking several fish pots of plaited bamboo strips into the shallow water of a small cove near the cave where living quarters were established. Fish nets of cotton cord had been woven by the pre-Columbian Indian occupants of the caves, but the sole reminder of this aboriginal fishing practice was the recovery of several net weights of notched stone from the middens near the cave entrances.

As the " staff of life " of these prehistoric cavemen consisted essentially of the meat of the conch and other shellfish, it is of interest to note that we were unable to find a bed of live conchs anywhere near the caves of the Playa Honda coast, although a careful search was made at various points. Natives professing to know of conch beds never were able to locate one, although a small number of recently dead conch shells of the same species, *Strombus pugilis* Linnaeus, as those of the cave deposits were found in one of the shallow coves near the keys. The absence of beds of live conchs is remarkable, as the bulk of the midden material covering the cave floors is made of these shells. Fishing for conchs is to-day an unknown art to the Dominicans of Samaná, although conchs had formerly been included in their diet.

Conch shells were frequently found on the surface or in near-surface deposits. These had been pierced or broken open with metal blades for extraction of the meat. The Indian method of extracting the conch from its shell depended in part on the use of fire, in roasting or boiling, the shell being subsequently pierced with a small hole in which was inserted a small shell pick. In place of this more refined method the heated shell was apparently battered with a stone until broken open.

The floor of the caves in the vicinity of the south shore of Samaná Bay is of the same limestone of which the small islands and the mainland of the south shore are formed. Samaná Bay is the drowned extremity of the great Cibao Valley which extends practically the entire length of the island and lies between the northern Cordillera Setentrional and the Cordillera Central. Samaná Bay, however, shows traces of recent emergence and a tilting of the rock strata. Evidence of this appears in the raised sea beaches, raised coral reefs, and sea caves, such as are especially numerous in the region explored by the Museum expedition along the south shore of the bay.

Sharply defined hills, formed by erosion, border the south shore of Samaná Bay west of the arm known as San Lorenzo Bay. These hills have precipitous walls, and where they reach the shore are undermined by the wash of the sea. The force of the sea action has slowly excavated caves, ranging in size from a few feet to a city block. Inside the caves the floor is level or downward in slope, the surface being usually filled in with débris and masses of fallen rock. The ceiling of the caves is high and vaulted in most instances, although the height varies from a few feet to more than a hundred. While many caves are raised above the present sea level, others are in process of formation. The plane of elevation of those caves which show traces of human occupancy is usually 10 or more feet above sea level, although the cave interior of formerly inhabited caves in some instances is inundated at high tide. Continuous elevated lines of sea cutting extend along the entire limestone area of the south shore of the bay. When two or more eroded beaches are exposed to view in superimposed position their course is not always parallel and the distance in feet between beach levels is not constant. These observations may indicate an irregular tilting of the rock or may illustrate the continuous eroding and cave-building power of the sea throughout the period of uplift.

The floor of the caves is covered with a thick layer of reddish yellow soil. The soil is exceedingly fine grained, but is compact and not at all sandy. Lying upon this stratum is the deposit of aboriginal kitchen middens. This culture layer is of irregular depth, greatest near the cave entrance, but sloping down to isolated heaps at a considerable distance away.

The kitchen middens of the caves contain deposits of conch, clam, and of other species of shells, crab claws, mammal, fish, turtle, and bird bones cast there by the pre-Columbian Indian cave dweller. The bottom of the deposits of shell is embedded in the yellow soil, while the upper sections are interspersed with deposits of ash, charcoal, and a small quantity of artifacts, including shell utensils, shards of broken pottery, and implements of flaked stone.

Above this layer is a deposit varying from a few inches to 2 feet in thickness belonging to historic times. This upper culture layer is nondescript in the extreme and includes fragments of pig, cow, and other animal bones, also coconut and calabash shells. Tools of iron, including a Spanish ax, were recovered from the vicinity of improvised fireplaces. Some of the more habitable caves occasionally are still occupied by Dominican fishermen and farmers who come to the south shore of Samaná Bay to tend their fish pots and to work in their small potato, coconut, and banana plantations. One large cave at the head or western end of the bay near the mouth of the Barracote River is occupied in season by a number of colorado wood (*Rhizophora mangle*) "mangle rojo" or tanbark peelers, who work in the mangrove swamps during the day but find the cave shelter a satisfactory temporary domicile.

Covering much of the interior floor of the caves are large deposits of bat guano, which have been extensively exploited for use as a fertilizer, and small deposits of pellets from an extinct species of giant owl. The removal of guano disturbed some of the culture deposits which in several instances had been taken out along with the guano. This commercial use of cave deposits greatly hampered our scientific investigations.

Deposition of shells in the kitchen middens had produced heaps of varying thickness, but in those portions of the caves, usually near the entrances, which were obviously devoted to culinary purposes, the refuse heaps reach a thickness of 9 feet or more. Where the deposits had not been disturbed or removed in part by collectors of fertilizers, excavation and systematic study of the refuse heaps was undertaken. The deposits on the floor of the caves were trenched, and when results justified the labor, more extensively uncovered.

Obstructions due to fallen rock were negligible, as the environs of Samaná Bay appear never to have suffered much from destructive earthquakes. Only a few broken stalactites were observed.

Railroad Cave.—As already pointed out, surface finds were distinctly post-Columbian, while the extensive middens containing rude artifacts of shell and bone, and of flaked stone were identical throughout and afforded no evidence of white man's trade objects. No stratification showing definitely marked differences in the culture remains were noted, except in one instance. The one exception was a clearly marked break in the deposits of the cave on the mainland just east of the abandoned railroad track about two-thirds kilometer inland from the shore of San Lorenzo Bay. The cave opens on the side of a cliff, the escarpment of an old sea cutting. It was named the "railroad" cave by members of the expedition to distinguish it from the several other caves on the mainland of the south shore of Samaná Bay. This cave is locally named Cueva del Templo.

Here, in the "railroad" cave, was found a layer of clam and oyster shells thickly interspersed with animal, bird, and fish bones and with crab claws, forming a deposit with an average thickness of from 3 to 5 feet. As excavation continued, there was found underneath this layer a stratum of black loamy soil of approximately 8 inches thickness. Underneath this deposit of soil was another culture deposit of a depth of 4 to 6 feet. This included mostly conch shells and practically no animal bones. Crude, characteristically pre-Ciguayan implements of shell, bone, and of flaked stone were recovered from this lower culture deposit, while pottery shards, some of which are decorated, and food bowls of pottery were recovered from the upper culture deposit. Another cave containing culture deposits is on the same side of the railroad track on a small key near the abandoned wharf. This cave was named "Simmon's" cave, as it is occupied by a family of negroes of that name. Altogether eight caves were visited and explored on the south shore of Samaná Bay.

Ciguayan Indians.—The culture stratification revealed in the deposits of the "railroad" cave may indicate that the cave in all probability had been abandoned by the conch eaters to be later reoccupied by aborigines having a preference for clams and in general for a diet including a variety of animal food. The later pre-Columbian cave dwellers possessed a material culture approximating that of the Ciguayan Indians, whose village sites and kitchen middens may be found on the northeast coast of the island, on the Samaná Peninsula. These Indians occupied the north shore of Samaná Bay and gave battle to Columbus when he entered the bay to observe an eclipse of the moon and to take on fresh water before returning to Spain to report his discovery of the New World.

The environs of Samaná Bay and Peninsula are of especial interest to the student of West Indian archeology because of the presence there of many heretofore unexplored village sites of the somewhat anomalous Ciguayan Indians. Columbus thought these Indians of Samaná to be cannibals and Caribs, as they were aggressively hostile and met the landing crew from the longboat of Columbus's flagship equipped with bows and arrows, sword-clubs, lances, and ropes with which to tie up the Spanish they intended to make prisoners. In his assumption that these Indians were Caribs of cannibalistic tendencies Columbus was in error, as the Ciguayans were later found to speak an Arawak dialect and to possess several culture traits similar to those aboriginal characteristics peculiar to the Arawak of Haiti and of the Greater Antilles in general. One of the most striking differences in their culture trait complex lay in their mode of hairdress and in the practice of not cutting their hair, as was the custom among other Arawakan tribes in the native Provinces of Haiti. The

early extinction of the Ciguay (long-haired) Indians of Samaná by their Spanish oppressors has made difficult the solution of archeological problems created by the extensive deposits of shells and other kitchen refuse in the caves of the south shore of the bay.

San Gabriel Cave.—The floor of the cave known as San Gabriel lies from 10 to 20 feet above the sea level. San Gabriel is a small islet just off the south shore of Samaná Bay. The cave occupies practically the entire interior of a limestone island key and is one of the most pleasantly habitable caves of the Playa Honda coast. Originally formed by sea cutting, the floor of the cave has been raised by the deposition of fallen rock masses which later disintegrated. Then, too, the gradual uplift of the land surface noticeable throughout the entire Samaná Bay area has brought the floor to a plane high above the level of the tide. The deposits of cultural material in the kitchen middens were therefore entirely in the dry. Deposits of conch, clam, and other shells are approximately 6 feet deep on the cave floor in the proximity of the only available cave entrance. This section of the cave floor is roughly 20 feet wide and 50 feet in length. The aboriginal hearth fire was maintained here underneath an overhanging ledge of rock and the kitchen débris making up the deposits in this area were sheltered from rain and storm. Hearth fires had been built up on successive layers of ashes and charcoal to a height several feet above the level of the kitchen midden, so that a sharp slope away from the fire place characterized the midden at this point.

A trench was dug from the outer edge of the midden, nearest the water's edge, toward the center of the deposit. This trench was 4 feet wide and was carried down to the bottom of the midden. As the San Gabriel cave is most favorably situated of all the caves on the keys of the Playa Honda coast, it was supposed that here might be found the best-preserved evidence of the type of culture of the aboriginal pre-Ciguayan cave dwellers of Samaná.

Results were disappointing, as nothing was recovered from the San Gabriel deposits that added to our knowledge gained from excavation of the several caves on the mainland of the south shore of the bay. Scattered through the midden were fragments of shells principally conch and clam; fragmentary shards of undecorated pottery; flaked but not chipped stone implements; caches of spherical pebbles and of coral; polishing stones and pitted stones obviously used as hammers.

From the "Railroad" cave were recovered three distinct types of pottery—a thin brown or gray ware, well fired but undecorated; a coarser, poorly fired, and undecorated ware; and a third type consisting of fragments of crude, brick-red pottery similar to the flat earthenware cassava griddles of the Taino but globose or bowl shape.

No complete bowl of this type was recovered. In another cave were unearthed fragments of large, shallow bowls with anthropomorphic clay figurine handles similar to the Ciguayan shallow bowls from Anadel, on the north shore of the bay. A few shards of decorated pottery of the characteristic Tainoan rectilinear incised ware were recovered at the "Railroad" cave, but such fragments were far outnumbered by innumerable fragments of shallow bowls and of potsherds of plain ware, for the most part, of a thin, well-fired type. Here, too, were found two large fossil conch shell gouges or celts of the Barbados shoehorn type. Another interesting discovery was that of a many faceted polishing implement of sandstone which was dug up from the bottom of the shell deposit. This object has elsewhere been called a celt polisher,[3] characteristic of Tainoan stone culture in Cuba and elsewhere in the Greater Antilles, but nowhere in any of the cave middens worked were seen characteristically Tainoan polished stone celts or fragments of such celts.

Each of the caves worked yielded quantities of improvised implements of shell and stone. Hammerstones, polishing stones, and flaked-stone implements betrayed a marked similarity and uniformity in type. Stone perforators, knives, scrapers, and picks were included in the cultural objects from the middens in the caves. A type of conch-shell implement resembling a pick was found in great quantity. This pick appeared to be entirely improvised from the lip of a small variety of conch, *Strombus pugilis* Linnaeus and was apparently used to extract the conch after it had been subjected to heat by boiling or roasting in order to loosen the hold of the mollusk on its shell. The characteristic Tainoan method of extracting a conch was to strike off a small segment from the apex and side of the shell, thus exposing the conch to the application of hot water, live coals, or the prodding of a shell pick. Another method was to pierce the shell with a hole 1 or 2 centimeters in diameter. The hole was made through the thinnest section of the lip wall and was evidently used in combination with the extemporized shell pick and a process of heating. Crab claws in great abundance were apparent everywhere in the refuse heaps in the caves. Quantities of small mammal, fish, bird, and turtle bones also occurred in quantity in the cultural deposits. The quantity of bird bones and of those of small mammals was much less in the cave deposits than in the kitchen middens near the open village sites of San Juan and Anadel, on Samaná Peninsula. The quantity of shells was, however, correspondingly larger in the cave deposits. The most striking observation was the similarity of food remains in the middens of the caves and of the open village sites, although the relative proportions varied from cave to cave and from village to village.

[3] Cuba before Columbus, by M. R. Harrington, vol. 2, pl. 108.

Burials.—Two burial places were discovered. These consisted of rock clefts protected by overhanging masses of limestone and were located on the south shore of Samaná Bay, one on Upper Orange Key, the other on Lower Orange Key, both locations being near the head of the bay and the mouth of the Barracote River. These burial chambers yielded human skeletal material in abundance, but fragmentary and incomplete for purposes of study. Pottery shards from burial urns, decorated stone beads, and carved figurines of shell and ivory were with the skeletal material. Much of the pottery was similar and in some cases identical with shards recovered from the Ciguayan village sites on Samaná Peninsula at Anadel and at San Juan. It would appear from this that the burials belonged to the Ciguayan rather than to the pre-Ciguayan cave dwellers.[4]

The sick were sometimes abandoned in a hammock out in the open forest or in their hut, being first provided with a small quantity of food and water. The hut was burned after their death. Bodies of caciques were eviscerated and dried over a fire, then wrapped in cotton cloth, and buried in a cave or in a burial mound. Schomburgk observed many mound burials in the valley of Constanza. Sometimes the head of a deceased relative or friend was removed from the body, dried, and preserved in a basket as a zemi. A peculiar practice has been observed in Jamaica, where a number of skulls were found in a burial cave arranged in a row under an overturned dugout canoe. An Anadel, in Samaná, at the edge of the midden, several large overturned oval reddish funerary vases containing the skull and long bones of individuals were found. A similar practice was observed at San Juan. Urn burials have also been found in St. Vincent. Columbus observed the aborigines of Paria, on the Venezuelan coast, drying bodies of their caciques on a frame over a fire. A similar practice was observed by Smith in Virginia.

No human skeletal material, except two molar teeth, were recovered from the cultural deposits of the caves, although the rock-cleft burials of Lower Orange Key were on the same level and not more than 100 feet distant from the remains of an aboriginal camp or village site. Here were exhumed tubular stone beads and small zemis of shell, also one of sea-cow ivory.

Traces remain of small aboriginal plantings of yams, sweet potatoes, and of calabash trees in the small coves between the eroded abut-

[4] It became evident from a study of the deposits in these aboriginal burial chambers that a specialized form of secondary burial had been customary with the Ciguayan Indians. It was possible to determine that two forms of pottery vases had been deposited with the burials—food containers, small in size; and large funerary urns of undecorated reddish ware. Practically no anthropomorphic clay figurine heads were found at the sites. In the disposal of the dead various practices prevailed throughout the several native Provinces of Haiti. Burial caves have been discovered in Cuba and in the Bahamas; also in Jamaica. In general, urn burial is indicated as having been the customary practice of the island Arawak, although local variations prevailed as to burial sites and as to preliminary stages in the preparation for secondary urn burial.

ments of limestone cliffs forming the south shore line of Samaná Bay. The calabash tree (*Crescentia cujete*) was general throughout tropical American wherever an agricultural complex had been developed by the native Indian population. Sometimes employed in combination with other materials, but more often without their addition, the fruit of the calabash served in various forms as a container and as an object for the recording of decorative designs. It is probable that such calabash plantings as still exist on the south shore were established by the Ciguayan Indians occupying the region in recent pre-Columbian times. There doubtlessly also existed small plantings of tobacco and of cassava.

Excavations at Anadel.—After completing archeological investigations of the cave deposits, work was begun at two Ciguayan village sites on the north shore, on the mainland of Samaná Peninsula. Two large village sites were systematically excavated in part—one at Anadel, a point 2 kilometers east from the town of Santa Barbara de Samaná, facing the north shore of the bay; the other at the mouth of the San Juan River on the north coast of Samaná Peninsula, about 10 kilometers due north of the town of Santa Barbara de Samaná. The Ciguayan site at Anadel was worked first. As the distance of the site from the town of Santa Barbara de Samaná is but 2 kilometers, no camp was made there.

Living quarters were established at Hotel "Bequi," in Samaná. "Bequi" is the daughter of an American negress who emigrated to Santo Domingo from Philadelphia in 1840. A large number of the descendants of American negroes who emigrated from Boston, Baltimore, and Philadelphia at the instigation of President Boyer, of Haiti, still live in the vicinity of Samaná. These negroes speak English, are Protestants, and are still more American than Dominican, although schools and better transportation facilities are slowly reducing their isolation.

The Ciguayan Indian village site at Anadel covers roughly a tract of 5 acres, although only a small portion of the site was found suitable for working. Much of the accumulated pottery, kitchen refuse, mammal and bird bones were found to be near the north side of the site facing a small stream which flows into the bay a short distance away. A spring of fresh water coming from the bottom of a steep hill 500 feet from the mouth of the stream gave the aboriginal occupants a plentiful supply of fresh water. It is generally assumed that most Ciguayan Indian village sites were located near springs and streams of fresh water, usually some distance from the coast. Aboriginal village sites on the island were generally located on some quiet stream or bay bordered by a wide sandy beach, in short, wherever food and water were most readily accessible.

A large quantity of cultural remains consisting of decorated pottery, implements of stone, shell, and bone, together with bones of small mammals, turtles, birds, and fish were collected at Anadel. Work was continued at Anadel for a period of three weeks. Altogether a greater variety of artifacts of a superior quality were secured from the Anadel site than from the cave middens on the south shore. Cultural objects such as implements are sufficiently similar from the two shores of the bay to justify an assumption of tribal identity for the later aboriginal occupants of the caves and the aboriginal population of Anadel. This identity of cultural remains, however, does not apply to the lower stratum of culture deposits from the caves which belongs to the pre-Ciguayan troglodytic population essentially dissimilar in most respects.

Work at San Juan site.—The most extensive site explored by the Museum expedition and the last of the season's projects to be undertaken was the Ciguayan village site at the mouth of the San Juan River, on the north coast of Samaná Peninsula, about 10 kilometers due north of the town of Santa Barbara de Samaná. The village was at one time the principal town of the Ciguayan cacique Mayobanex. A little bay known as Punto Escondido indents the abrupt coast at the mouth of the San Juan River, on which the village fronts. The bay is fully exposed to the Atlantic Ocean and incoming tide and breakers must have made primitive travel in native dugout boats difficult in the extreme. Fishing for manatee was nevertheless occasionally successful, as vouched for by the numbers of hafted picks recovered by the expedition fashioned from the ribs of the manatee. Water from the San Juan River for some distance upstream is brakish; water from a spring near by is also salty. The native population must have preferred living near the sea and going some distance for their water rather than occupying a site farther upstream.

The valley of the San Juan River is accessible by horse and bullock transportation only, as there are no roads suited to wheel traffic. The soil is rich and deep, and clumps of bamboo and numerous tiny banana or plantain gardens become more numerous as the valley broadens out near the mouth of the stream and the north shore of the peninsula. The hills here become rougher and more picturesque. Gabb, who was at the site of the village in 1869, speaks of the mouth of the stream as being "as wild a spot as can well be imagined; a long sand beach, ending abruptly against a high bluff of black rocks, with the broad Atlantic thundering against it with a ceaseless roar." In the sixties, when Gabb visited this region, a small settlement of two huts was near the mouth of the river. The Museum expedition found several huts of squatters and tenants scattered about the area, but no systematic attempt at settlement and agriculture anywhere

in the valley. The peninsula as a whole is undeveloped and is almost entirely covered with nondeciduous forests. If we are to judge from the size of the midden and the quantity of cultural remains from the Indian village site at the mouth of the Rio San Juan, agriculture on the peninsula in pre-Columbian times was more extensive than it is to-day.

While working the site at San Juan living quarters were established at the Finca de la Esperanza, an abandoned cacao plantation picturesquely located among the mountain ridges which traverse the entire length of the peninsula. The finca was well adapted to our purposes, being healthfully located in a region high above the mosquito and fly infested coast. Each morning the long journey down the mountain trail to the coast was made on the backs of the rather ill-tempered diminutive stallions belonging to John King, a Dominican who became our patron and guide. The more powerful but no less sure-footed bulls carried back up the mountain trail our newly acquired specimens of natural history, pottery, and other cultural objects, and occasionally even a member of the expedition back to the finca in the cool of the evening. The success of the expedition depended in no small measure on the skillful management of our native cook by Mrs. Miller, who also acted as official interpreter for our party.

The greatest difference observed in the artifacts recovered from the two shores of the bay was the almost entire lack of decorated pottery from the caves of the south shore. In fact, the entire absence of pottery was noted at some of the caves where implements of shell and utensils of a seemingly extemporized nature prevailed. It is believed that these cave deposits are pre-Ciguayan and are not related to the finds of decorated aboriginal pottery from the north shore, which are decidedly Tainoan (Arawakan) and of a much later date. The site at Anadel produced a plentiful supply of decorated and plain pottery fragments characteristically Porto Rican in type. One of the striking discoveries at San Juan was the large number of pottery fragments which resemble in every detail the peculiar type of pottery discovered by Dr. J. W. Fewkes at the Cueva de las Golondrinas, near Manati, in Porto Rico. Several varieties of pottery were uncovered at San Juan, while at Anadel there was not such great variety in types.

Large quantities of leg bones of pigeons were recovered at the site of San Juan. With this exception and that of the worked manatee ribs, excavations there revealed the same variety in animal and bird bones as at Anadel.

The site at San Juan was intensively worked for a period extending over a month, from 6 to 22 men being regularly employed.

It is possible, however, that more extensive excavations would lead to a discovery of stratification, showing occupation at different times by different groups of Arawak, and of a culture sequence as yet not determined.

Archeological investigations prior to 1928.—Sir Robert Schomburgk was the first student to describe acheological objects from surface finds and kitchen middens on Samaná Peninsula. Schomburgk undertook no intensive archeological project, although his observations and descriptions are accurate, as they are based on extensive investigations on the archeology and on travels in eastern Santo Domingo.[5]

The researches of William M. Gabb in the vicinity of Samaná Bay have previously been mentioned. Although Gabb's primary interest was regarding the geology of the region, he made valuable observations and collections. He carefully studied and worked the middens and cultural deposits in one of the caves on the south shore of Samaná Bay. It is impossible to identify the cave explored by him from his description "in the vicinity of San Lorenzo Bay," as several of the caves answer to the same general description relative to the number of openings, size, and other details. Gabb makes the following general summary regarding his investigations of the shell deposits.[6]

Careful search was made in all the caves where any depth of deposit existed over the rock bottom in hopes of finding some remains of cave animals, such as those described from Anguilla, but none seem to exist. In the cave where I slept there is an extensive and interesting kitchen midden divisible into two eras; the older marked only by shells and a few turtle and fish bones, resting on the rocky floor, and through which I excavated to a depth of 9 feet. Over this is a thinner layer of ashes with bones of birds, agouti, fish, and turtles, and an abundance of pottery evidently of the immediately pre-Columbian era. Over this, liberally intermixed with bat guano, is a modern deposit of broken earthen and iron kettles and beef and pig bones, indicative of a higher, or at least, more modern civilization, though justice requires us to admit that the pottery is inferior in workmanship, in elaborateness, and in beauty of design to the preceding era. It is a remarkable circumstance that, although the Indians of the pottery period manufactured polished stone hatchets and other implements equal in degree of finish to the finest ever discovered, and they are not rare, not a stone instrument was discovered in the cave, unless we except some rough rounded pebbles found among the shells, and which seem to have been used as hammers for extracting the mollusca. I may also mention, although irrelevant, that no arrow or lance heads have ever, so far as I can learn, been found in the country, notwithstanding that the jaspers of the Nigua, of which the hatchets were made, are admirably adapted for this purpose. The absence of any mammal larger than the timid little agouti and of any birds fit for food, except the pigeons, equally difficult of approach, probably rendered the use of arrows for the chase nearly unnecessary; while not improbably

[5] Ethnological Researches In Santo Domingo, Journ. Ethnol. Soc. London, Dec. 11, 1851.

[6] On the Topography and Geology of Santo Domingo, Memoirs, Amer. Philos. Soc., vol. 15, pp. 146–147. 1872.

fragments of shells, or the innumerable varieties of hardwoods, much easier to prepare than stone tips, may have answered the required purpose in warfare.

The first intensive archeological investigations in eastern Santo Domingo were conducted by Theodore De Booy in 1913 for the Museum of the American Indian (Heye Foundation). De Booy's explorations extended southward from Cape Macao, a point approximately 50 kilometers south of Cape Raphael, which promontory marks the southern entrance to the Bay of Samaná. At Salado, near Cape Macao, caves were explored and an intensive study made of the pottery types there uncovered.[7]

During the same season in which he explored the cave deposits at Salado, De Booy studied the cave deposits on the eastern end of the island of Saona, which constitutes the extreme southeastern projection of the island of Haiti. In 1916 a large shell heap [8] on the Cristobal Colon sugar estate on the Higuamo River near the town of San Pedro de Macoris, on the southern coast east of Santo Domingo City, was excavated. Pottery types from eastern Santo Domingo discovered by De Booy are practically identical with earthenware types recovered from Anadel and San Juan by the Museum expedition.

Dr. J. Walter Fewkes describes pottery types from eastern Santo Domingo, but includes no specimens from Samaná.[9] Aside from the typically Taioan earthenware described by Doctor Fewkes, the most striking resemblances to pottery from the San Juan site on Samaná are the fragments recovered by him from the Cueva de las Golondrinas near Manati, in Porto Rico.

GEOGRAPHY OF SAMANÁ

Early travel and trade routes.—The archipelago known as the West Indies extends from Florida to South America in the form of a crescent, a distance of 1,600 miles. Something regarding the geography and geology of the archipelago must be known and considered if the archeology of this extensive geographical area is to be discussed. More particularly must geographical data carefully be brought to bear on the archeological situation of Samaná, the region particularly under consideration.

The northern islands of the West Indian Archipelago, the Bahamas, were known as the Lucayan Islands to the aboriginal Arawak population. These islands are of a low lying coralline formation like that of Florida, which is but 60 miles distant from the nearest

[7] Pottery from Certain Caves in Eastern Santo Domingo, West Indies, American Anthropologist, new ser., vol. 17, No. 1, January–March, 1915.

[8] Santo Domingo Kitchen-Midden and Burial Mound, vol. 1, No. 2, Indian Notes and Monographs, Museum of the American Indian, New York, 1919.

[9] The Aborigines of Porto Rico and Neighboring Islands, Twenty-fifth Annual Report of the Bureau of American Ethnology, 1907. Also Culture Areas in the West Indies, Thirty-fourth Annual Report of the Bureau of American Ethnology, 1922.

island of the group. The peninsula of Yucatan is 120 miles distant from the western end of Cuba, or twice the distance from Florida to the Bahamas. Some of the islands known as the Lesser Antilles, namely Grenada and Tobago, are 80 miles off the Venezuelan coast of South America. At neither of its outlying points therefore, are the West Indies at all remote from the continental mainland of North or South America.[10]

The delta of the Orinoco River empties itself into the Gulf of Paria on the Venezuelan coast, which is in part inclosed by the large island of Trinidad. Point Galera on the island of Trinidad, is separated from Tobago, of the Lesser Antilles, by only 25 miles of water. The entire area surrounding the delta of the Orinoco is now and in pre-Columbian times probably had been occupied by the Warrau, a coast tribe related linguistically neither to the Carib nor to the Arakak Indians, who occupy the Guiana coast of South America southeast of Venezuela. The Orinoco discharges its water into the Gulf of Paria and elsewhere along the coast through 20 distributaries covering 160 miles of South American coast directly facing the Lesser Antillean Islands. It is therefore very probable that a canoe culture developed by the coast Arawak and Carib groups of northern South America reached the Greater Antilles by way of the smaller outlying Lesser Antilles. Dislodged groups followed the outgoing current of the Orinoco in their dugout canoes, paddled their way along the leeward side of the island chain, and gradually approached the large islands of Porto Rico, Haiti, Cuba, and Jamaica. In this northwestward migration wind and ocean currents were favorable factors.

Lesser Antilles.—Columbus found the islands of this group in possession of the Carib Indians, who had but recently displaced an earlier Arawakan group, the Igneris. He observed unmistakable evidence of cannibalistic practices at Guadaloupe and Dominica on his arrival in the West Indies during the second voyage. He thought he had found representatives of the same cannibalistic Caribs at Samaná during the first voyage, but later found this observation to be erroneous.

Several of the islands of the Lesser Antilles are of marine formation and are coralline reefs or of limestone formation. The islands of Grenada and Dominica are volcanic in origin and have volcanic peaks of considerable elevation. The high peak of Mount Pelee, on Martinique, is visible at a distance of 45 miles and must have afforded a navigation aid to natives traversing some of the larger

[10] An excellent monograph on the physical basis of prehistoric tribal and culture migrations in the West Indies is that by Adolfo de Hostos, entitled "Notes on West Indian Hydrography in Its Relation to Prehistoric Migrations." This careful study appeared in the XX Congresso Internacional de Americanistas, p. 239. Rio de Janeiro, 1924.

water gaps. The gap between the islands of Sombrero and Anegada is about 50 miles.

The approach to the island of Haiti from Porto Rico must originally have been along the northern shore of the island rather than the southern, as the Carib raiders were still following the northern route when their activities were brought to an end by the advent of the Spanish. Mona Passage, separating Porto Rico from Santo Domingo, was much used by the Arawak in the late fifteenth and early sixteenth centuries. The passage is 64 miles wide, but was traversed daily by the aborigines at the time of the discovery. Mona Islanders were noted for their excellent cassava bread, while the natives of Gonave Island, on the opposite or western end of Haiti, achieved fame as workers in wood. Mona Island, in mid-channel, afforded a convenient shelter, and, later, a haven of refuge from the Spanish encomienderos.

Topography of Samaná.—The West Indian Archipelago in recent times has undergone subsidence, although recent uplifted strata extending over limited areas, as in Samaná, are marked by continuous ocean cutting. The land mass extending from Cuba to the Virgin Islands is now submerged in part, but is still represented by the islands of Cuba, Haiti, and Porto Rico. A central axial mountain range traverses these islands and reaches its highest elevation on the island of Haiti. In Santo Domingo the highest section of the axial cordillera is known as the Cordillera Central. Another range paralleling the central cordillera on the north is known as the Cordillera Setentrional. Samaná Peninsula, in northeastern Santo Domingo, forms an outlying spur of this range.

No traces of recent volcanic activity appear on the peninsula; the oldest rocks are metamorphic and igneous and form a group of schists, shales, serpentines, limestones, and conglomerates. On the south shore of Samaná Bay the mountain ridges east of Sabana de la Mar are composed of sedimentary schists, while west of that point limestones prevail.

The peninsula called Samaná is a continuation of the northern cordillera, while the southwestern peninsula of Haiti connects with the central cordillera. Samaná Peninsula is a mass of irregular mountain ridges and spurs with a small fringe of lowlands along the coast. Although it extends approximately 50 kilometers eastward from the mountainous area of Cordillera Setentrional, the peninsula's average width scarcely exceeds 15 kilometers. Samaná is the native Arawak term for the territory roughly corresponding to the present boundaries of the Dominican Province of Samaná. It was formerly also written Xamana. Similarly, the term Haiti, or Aiti, is the Arawak term for the entire island. The Spanish

renamed the island Española, later corrupted into Hispaniola. The name Haiti has again come into use as a geographical term along with a growing tendency to refer to that part of the island which is occupied by the Dominican Republic, as Santo Domingo, the same term which had been given to the capital city of that country.

The more elevated peaks of Samaná Peninsula rise to an elevation of 500 meters above the sea level. Sugarloaf (Le Pilón de Azúcar) is located 6 or 7 kilometers inland from the town of Santa Barbara de Samaná; Monte Diablo rises from the water's edge at Punta Balandra, the northern and eastern entrance to Samaná Bay, while Loma Las Canitas is at the western end of the peninsula near the town of Sánchez.

The eastern end of the peninsula is a limestone plateau from which emerge near the coast a number of subterranean streams. These streams are for the most part merely springs and none of them at all approximate the magnificence attributed to them by the unreliable Peter Martyr, who describes them as large enough to admit an ocean-going sailing vessel, and as characterized by falls, whirlpools, and cavernous chambers so large that the mariner entering one of them readily lost himself when shut off from the outer sunlight.

Between Los Cacaos and the town of Santa Barbara de Samaná on the northern shore of Samaná Bay, hills of several hundred feet altitude and mountain ridges extend to the water's edge. A trail along the beach eastward from Samaná is passable only at low tide; at other times during the day a journey must be made over the summits of these hills if one wishes to enter the town of Santa Barbara de Samaná from the east. It appears that no effort has ever been made to improve roads on the peninsula, with the exception of the road (carretera) from Sánchez to Samaná. Trails to points in the interior of the peninsula follow the natural contour of the land and are deeply furrowed with the hoof tracks of horses and bullocks. At Samaná a small valley breaks through the hills from the west and is utilized as the roadbed for the carretera from Sánchez to Samaná now under construction.

Samaná Bay and delta of Yuna River.—Samaná Bay is the drowned extremity of the great Cibao Valley which occupies the flat plain lying between the two axial mountain chains mentioned previously. Traces of recent slight emergence may be seen in the raised lines of sea cutting, raised coral reefs, and sea caves that now stand above tide level. A flat swampy area, known as the Gran Estero, separates the west end of the Samaná Peninsula from the mainland of the island. The Gran Estero was formerly one of the distributaries of the Yuna River, which traverses the great central plain, the valley of the Cibao. The water channel through the Gran

Estero from the bay to the Atlantic Ocean on the north was formerly sufficiently deep for purposes of navigation, but has become partly closed through uplift and with silt carried down by the Yuna River. Charlevoix's map of Haiti, published in Paris, as late as 1730, still shows a water channel extending from Samaná Bay to the Atlantic Ocean on the north coast.

The town of Sánchez, the terminus of the Samaná-Santiago Railroad and a port of entry, is located at a distance from deep water due to the silting in from the Yuna River. Large vessels are unable to dock and must load and unload cargo from lighters. The bay as a whole has a depth great enough to admit large liners, but not to the head of the bay. Shoal water at the mouth of the bay limits passage to a channel near the northern shore. The bay has an average width of 15 to 20 kilometers, while the distance from Punta Ballandra, the bold, rocky headland at the entrance of the bay, to Sánchez, at the head of the bay, is 45 kilometers.

The south shore, from the head of the bay to the arm known as San Lorenzo Bay, is a succession of jagged cliffs, innumerable islets, and intervening water passages and coves projecting from a more regular escarpment of limestone formation in the background. The irregular coast line west of San Lorenzo Bay is locally known as the Playa Honda coast. East of San Lorenzo Bay and the small village of Sabana de la Mar, the country is low and thickly forested.

The shore line of the Playa Honda coast is undermined to a depth of several feet from the wash of the tide. The clifflike escarpment of the coast at times is terminated abruptly at the shore line; again, there are deep indentations or coves between the cliffs which here are at right angles to the shore line. Many of these cliff walls are punctured by entrance to caves formed by ancient sea cutting. It was these caves of the mainland rather than those on the island keys that offered the best material for archeological investigation by the Museum expedition.

The same excavating force operating on the mainland had excavated caves from the interior of several of the keys of the Playa Honda coast. There has been a continued uplift, as evidenced by the position of some of these caves—10 to 40 feet above tide level. Some of the caves are cut at lower levels, while others are still in process of formation. Many of the larger caves are still subjected to sea cutting under some of the arches, while other arches and the vaulted roofs reach a maximum height of 100 feet above the present floor level. The floors of all the chambers, whether recent or old, are of limestone, except where they are covered with débris, recently formed soil, or cultural deposits.

Rainfall.—Rainfall is very heavy in Samaná Peninsula, but is more evenly distributed throughout the year than in some other parts of the island. It is raining at some point in Samaná Bay or the surrounding shore practically all the time. Yet, at Samaná, during the months of February, March, and April, 1928, a prolonged period of drought caused a local water famine. Dependence for drinking water is placed on rain water which is stored in cisterns above ground. Rainfall is more abundant at Sánchez, at the head of the bay, than at Samaná, farther to the east. Sabana de la Mar, on the south shore of the bay, also has a heavy rainfall. Vegetation, in consequence of the heavy rainfall and fertile soil, is dense throughout Samaná Peninsula. Soil in the mountains is thin and stony, but the valleys have fertile alluvial soil. Precipitation records at Sanchéz shows an average fall of rain of over 6 inches per month, except for the period from December to April. For portions of the interior and western sections of the island there appear to be two periods of heavy rainfall—one in November, the other in spring. The western portion of the great central plain is much drier. Thorn forests begin west of the interior town of Santiago de los Cabelleros.

NATIVE PROVINCES

The Arawak Indians of Haiti and Santo Domingo were grouped in Provinces having more or less well-defined natural boundaries. The political and religious head of each of the principal Provinces, of which there were five, was known as a cacique. Caciques were the leaders and advisers of their people and appear to have combined the native offices of chief and medicine man. Their powers were extensive, as they ordered the routine of daily life and work. They assigned to individuals such widely separated duties as communal hunting, fishing, and the tillage of the soil; they also presided at religious ceremonies. Peter Martyr observed that "every king hath his subjects divided to sundry affairs, as some to fishing, other to hunting, and other some to husbandrie." Columbus writes that "I could not clearly understand whether this people possess any private property, for I observe that one man had the charge of distributing various things to the rest, but especially meat, provisions, and the like." No regular tribute was demanded by the caciques from their subjects, but the best of the food and the finest of the agricultural products were reserved for them. According to Oviedo, one species of the smaller rodents of the genus *Plagiodontia* was reserved for the exclusive use of the cacique and his family. Fewkes says that "as a rule each village seems to have had a chieftain or patriarchal head of the clans composing it, whose house was larger than the other houses and contained the idols belonging to the families. The cacique,

his numerous wives and their children, brothers, sisters, and other kindred were a considerable population, often forming a whole village. In addition to the household of the cacique, consisting of his wives and immediate relations, a prehistoric village ordinarily contained also men, women, and children of more distant kinship." The term cacique is used in a very loose sense by the early chroniclers to designate any leader or headman. Caciques were aided by subchiefs or attendants, some of whom governed districts. Under these were the village headmen, of which there were 70 or 80 for each of the five native Provinces of the Island.

Of the five leading caciques at the time of the discovery only one, Goacanagaric, who ruled over the Province of Marien, on the North coast, remained friendly toward the Spanish. The native Province of Marien extended from Cape Nicolas, on the extreme northwest, to the Rio Yaque del Norte, which debouches on the north coast in the vicinity of Monte Cristi. The watershed between the rivers Yuna and Yaque del Norte marked the interior boundary of the Province of Marien. This is in the arid region of the upper Yaque Valley on the southern slope of the Cordillera Setentrional. In this Province, on the north coast, a short distance west of the mouth of the Rio Yaque del Norte, Columbus planted the first Spanish colony in America. This colony was the unfortunate La Navidad, planted near the site of the present town of Monte Cristi. The extermination of this settlement was due not to the ill will of the locally dominant cacique Goacanagaric but to the aggressive hostility of the cacique Caonabo, of the Province of Maguana, and to the dissolute conduct of the members of the colony.

Maguana, signifying little plain, was ruled at the time of the discovery by the immigrant cacique Caonabo. This cacique, according to some sources, was a Carib, but more likely was a Lucayan, or an Arawak from Porto Rico, which was known as the island of Carib. His territory included most of the Cibao Valley and mountains of Cibao, where the natives mined gold from the streams. At a later period the Cibao Valley developed the richest sugar lands of the entire island. The Province of Maguana extended to the west coast and included the valley of the Artibonite (Hattibonito) River, the present boundary between the two island republics of Haiti and Santo Domingo.

Magua, meaning country of the interior, " inland empire," stretched from sea to sea, from the north to the east coasts south of Samaná. It included the central and best portions of the Cibao Valley, namely, the so-called Vega Real, which comprised the east or lower sections of the valley. Guarionex was cacique of the Vega and of the southern slope of the Cordillera Setentrional, while the Ciguayan Indians

MAP SHOWING THE LOCATION OF NATIVE PROVINCES TOGETHER WITH NAMES OF RULING CACIQUES AT THE TIME OF THE DISCOVERY. NOTE THE POSITION OF SAMANÁ PENINSULA IN THE NORTHEAST ENTIRELY SURROUNDED BY WATER. FROM CHARLEVOIX'S HISTORIA DE L' ISLA ESPAGNOLE, PARIS, 1730.

of Samaná Peninsula and of the northern slope of the Cordillera Setentrional occupied the northern sections of Magua Province under the leadership of the cacique Mayobanex. On the south, the Province of Magua was bounded by the Cordillera Central. The Cibao Valley, especially the Vega Real, was the most densely populated region of aboriginal Haiti. It is still the most prosperous district. The deep, black, loamy soil receives ample rainfall and the valley is still adapted to intensive agriculture now as it was in the time of Guarionex. On the north coast the Province of Magua extended as far west probably as Puerta Plata, while it was broader south of the mountains, where it reached as far westward as the towns of La Vega and Santiago.

Xaragua Province was bordered on the east and rather indefinitely on the north by the Province of Maguana. It formed the southwestern Province of the island. It lay for the most part on the inner side of the Gulf of Xaragua, now known as the Gulf of Gonaive, on which Port of Prince is located. The Province included the surrounding mountains as well as the dry flat land, where irrigation was developed on an extensive scale. Cotton was produced in comparatively large quantity, considering the relatively unclothed condition of the natives. Xaragua was considered the richest and the best-developed native Province of the island. Its cacique at the time of the discovery was Behechio, who, with his sister Anacaona, offered to pay the tribute exacted by the Spanish in produce instead of gold. Anacaona was the widow of the cacique Caonabo, of the Province of Maguana. After the death of Behechio his sister, Anacaona, inherited the right to govern the Province of Xaragua. At one occasion when the Lord Lieutenant (Adelantado) Bartholomew, the brother of Columbus, visited the town of Behechio and Anacaona these rulers presented Bartholomew with 14 carved wooden seats, 60 earthenware vessels, and 4 rolls of woven cotton. Another name sometimes given to Xaragua is Guaccairima. This term is apparently a broad one and included all of the southwest coast and a large portion of the southern coast as well. Gonave Island, situated a few miles from the west coast, was noted for the excellence of its native wood carving, and the islanders carried on a trade with villages of the mainland near by.

The fifth great native Province, that of Higuey, offers difficulty in the defining of its boundaries. It probably included all of southeastern Haiti south of the Cordillera Central and east of San Domingo Bay.

In the De Orbe Novo of Peter Martyr an entirely different classification of native Provinces is given from that of other Spanish chroniclers. Martyr names the eastern Province of Higuey with the term Caizimu, which, according to his description, extends from

the eastern "point" (Cape Engano) of the island as far westward as the river Hozama (Ozama), which flows by the capital city, San Domingo. The northern border of this Province of Martyr's was marked by precipitous mountains (Cordillera Central), which, on account of their steepness especially, bore the name "Haiti." The Province of Huhabo (Magua?), according to Martyr, lay between the mountains of Haiti and the Iacaga (Yaque) River. The third Province from the east was supposed to extend as far west as the mouth of the Iacca (Yaque) River, one of the rivers "dividing the island into four equal parts." The Province was supposed by Martyr to extend to the Cibao Mountains where gold was mined. Another Province, Bainoa, began at the frontier of Cahibo (Cibao?) and extended as far as the island of Cahini (?), almost touching the north coast of Hispaniola (spelling is Martyr's) at the place where the colony was once founded (La Navidad). Martyr's Province of Bainoa may either be Marien or Maguana. The remainder of the island along the west coast formed the Province of Guaccairima (Xaragua), thus called "because it is the extremity of the island." [11]

An interesting observation regarding Martyr's classification of native Provinces and subprovinces is that he agrees with other early Spanish chroniclers in placing Xamana (Samaná) as a subprovince ("canton") of the northeastern Province of Huhabo (Martyr's term for Magua) and not of the southeastern Province of "Caizcimu" (Higuey). He also agrees with other more reliable writers in saying that the language of the Province of Huhabo (Magua, which includes Samaná) differed from that spoken elsewhere in the island. He also refers to the natives as "Macoryzes" (people of foreign speech). According to Martyr, Higuey was a canton of "Caizcimu." The term "Caizcimu" is not used by other Spanish writers.

Las Casas speaks of Cotubanama as the cacique of Higuey Province, while other writers refer to the cacique Cayacoa as ruling the eastern portion of the island. Still other writers mention the name of the "queen" Higuanama as a ruler of the eastern Province of Higuey. The several writers are, of course, referring to various periods of time, as the Spanish ultimately succeeded in destroying all native rule and in wrecking the lives of the native caciques.

The statement made by the Spanish friar Ramon Pane confirms the notion that the language of the Ciguayans of Samaná differed from that prevailing elsewhere on the island. Pane was ordered by Columbus to live among the natives and to record what he might observe concerning their religious beliefs and practices. Pane's notes are brief but are invaluable. The manuscript is incorporated in

[11] De Orbe Novo, vol. 2, pp. 366–367.

Churchill's Voyages with Ferdinand Columbus's narrative of "the history of the life and actions of adm. Christopher Columbus, and of his discovery of the West Indies, called the New World, now in possession of His Catholick Majesty." [12]

The following passage from the manuscript is of interest in this connection.

> The admiral told me that the language of the Province Madalena Maroris was different from the rest, and was not understood in all parts of the country; and therefore bid me go and reside with another principal cacique, called Guarionex, lord of many subjects, whose language was understood all over the island. I went to reside with the said Guarionex. I said to D. Christopher Columbus: My lord, why will you have me go and live with Guarionex when I know no language but that of Maroris? (Macoris—of the long-haired Ciguayans of Samaná and the northeast coast.) Be pleased to give leave that one of these Nohuircis (?) who know both languages go with me.

Differences in speech between the Macorises (Ciguayans) and the subjects of Guarionex of the Cibao Valley were in all probability not far-reaching. The Ciguayans were a mountain folk and spoke an Arawak dialect. They were not Caribs, a fact brought out by their traditional friendship for the Indians of the Cibao Valley and by their alliance with them in war.

"Macorix de abajo" was under the leadership of the cacique Guarionex and included a long narrow portion of the Vega Real at the southern foot of the Cordillera Setentrional and stretched northward to Marien and as far west as the town of Santiago de los Cabelleros. "Macorix de arriba" was the home of the long-haired Ciguayans under Mayobanex and extended to the north coast of the island on the northern slope of the Cordillera Setentrional and included Samaná Peninsula. The south shore of Samaná Bay belonged to Macorix de abajo under Guarionex.

NONAGRICULTURAL CAVE DWELLERS

Within historic times the aboriginal population of the West Indies has included two great linguistic stocks—the Carib and the Arawak. The Arawak population of the Greater Antilles and of the Bahamas was known to the early Spanish explorers as a peaceful (Taino) agricultural people rapidly giving way before the aggressive raiding bands of Caribs from the Lesser Antilles. In St. Vincent, Martinique, Dominica, and Guadeloupe, and several other islands of this group, Columbus encountered the Carib and became acquainted with his depredations.

The Carib had replaced the Igneris, an Arawak stock, on the islands of the Lesser Antilles and were encroaching on Arawak

[12] The manuscript of F. Roman, concerning the antiquities of the Indians, which he, as being skilled in their tongue, has carefully gathered by order of the admiral, vol. 2, pp. 543–554, London, 1744.

settlements in Porto Rico and along the north coast of Haiti and of eastern Cuba. How long a period of occupancy of the Antilles by the Arawak had elapsed prior to the advent of the Carib remains an unsolved problem. Cuba, Haiti, and possibly Porto Rico had previously been occupied by a primitive aboriginal culture group characterized by the custom of dwelling in caves. The deposition of culture remains in the form of shell middens, shell implements, and of several other forms of crude and extemporized implements—all are a remainder of the former existence of this troglodytic pre-Arawak population.

That the Taino of Santo Domingo and of Cuba were preceded by an earlier aboriginal population has been reported by Harrington, based on evidence of an archeological nature from caves in Cuba [13] but anticipated in vague reports by Las Casas, Oviedo, and others as also present in southwestern Haiti. Morales wrote that in the mountain of western Haiti there existed wild men without fixed abode, without a language, and not given to the practice of agriculture. Oviedo wrote that a cave population in western Haiti was not subdued until 1504. The National Museum expedition of 1928 found extensive cultural remains of a pre-Arawak population in the caves of Samaná in northeastern Santo Domingo, in the territory later occupied by the Ciguayan Indians. No previous accounts regarding a pre-Arawak population as having lived in eastern Santo Domingo have ever been made.

Martyr wrote in his De Orbe Novo [14] that a cave population similar to the Guanahatabeyes "Ciboneys," also mentioned by Las Casas and Velasquez, had lived on the southwestern peninsula of Haiti. Martyr relates that "it is said there is a savanna district in the most westerly province Province of Guaccairima (Xaragua) inhabited by people who only live in caverns and eat nothing but the products of the forest. They have never been civilized nor had any intercourse with any other races of men. They live, so it is said, as people did in the golden age, without fixed homes or crops or culture; neither do they have a definite language. They are seen from time to time, but it has never been possible to capture one, for if, whenever they come they see anybody other than natives approaching them, they escape with the celerity of a deer." Oviedo also mentions the cave folk of the Province of Guaccairima (Xaragua). Las Casas lived in the villages of the extreme southwestern portion of the island in Xaragua. He did not see the cave dwellers reported by other chroniclers, but reported the population of Xaragua (Guaccairima, the present Haitian Province of Jeremie) as

[13] Cuba Before Columbus, by M. R. Harrington, vols. 1 and 2, 1921.

[14] De Orbe Novo, the eight decades of Peter Martyr d'Anghera, by Francis Augustus MacNutt, New York and London, 1912. P. 380.

resembling in their culture the Higuey Indians of Santo Domingo. He mentions the "Ciboneys" as being a primitive group living in the mountains of the interior and as not given to the practice of agriculture as were the natives of the central valleys and coastal plains.

Aside from the casual and in part untrustworthy references to the primitive cave-dwelling population of Haiti to be found in early Spanish narratives, there exists no reference in the early literature of the West Indies hinting at the existence of a pre-Arawak race of Indians.

It remained for archeological investigations to substantiate, at least in part, the references contained in the literature cited. Harrington's discoveries in Pinar del Rio Province in western Cuba, also in other sections of the island of Cuba, are well known. The recent discovery of a similar culture from cave deposits in eastern Santo Domingo by the Museum expedition are here mentioned for the first time. It is possible that Arawak imigrants to the islands of the Greater Antilles had subjugated these earlier people in much the same manner as they themselves were later replaced by the Carib in the Lesser Antilles. Las Casas believed this to be the case when he wrote, referring to the natives of Cuba, that the "servants subjugated by the invaders from Haiti were known as 'Ciboneyes.'" These aborigines of western Cuba spoke a language that Columbus's Taino interpreters from the Lucayan (Bahamas) Islands could not understand. Harrington is authority for the statement that "Ciboney" culture can be traced from one end of the island of Cuba to the other.

Caves were used by the island Arawak of Haiti, Cuba, and Porto Rico for various purposes. Evidence collected by the Museum expedition points to their use of the caves of Samaná as temporary dwelling places at a time when the earlier pre-Arawak cave-dwelling population had already been superseded. From the literature we gather that they also employed the caves as ceremonial chambers. The large "pillar rock" carvings, in which stalagmites located near the cave entrances are so shaped as to resemble anthromoporic zemis, or sacred images, point to the use of the Samaná caves as Arawak places of worship. An observation made by Spanish writers is that fishermen occupying the small islands off the coast of Cuba and Haiti were subjects of the superior Taino (Arawak), but that they did not live in caves. Neither do we find any authentic reference in the literature on the tropical South American tribes relative to their use of caves for other purposes than as burial chambers or for spirit worship. In South America some caves yield no skeletal material, while others in the Orinoco Valley contain pottery urn burials. In

eastern Brazil occur caves that were formerly used as shelters by groups of hunters. Caves on the island of Trinidad yielded no skeletal remains, although caves on the island of Jamaica contained burials. No burials were found in the caves of Samaná, although rock-cleft burials on near-by islands were uncovered by the Museum expedition.

HISTORICAL NOTES ON THE ETHNOLOGY OF THE CIGUAYAN INDIANS OF SAMANÁ

During his first voyage to the New World Columbus heard of the island of Haiti while cruising westward along the north shore of Cuba. Lucayan Indians from the island of "Guanahani," where Columbus had first landed, accompanied him as interpreters and guides on the interisland voyage which followed. As their speech was Arawak, which was understood throughout the Bahamas and the Greater Antilles, their services were of great value. They informed Columbus that land existed on the southwest, northwest, and the southeast. By this they obviously referred to the islands of the Greater Antilles and to Florida.

Their repeated references to a land lying to the east as being rich in gold influenced Columbus to turn about and to sail his caravels eastward. The high mountains of the island of Haiti were soon seen looming in the distance. The Lucayan guides now assured Columbus that the land sighted was inhabited by cannibals, while the land itself was referred to as Bohio, the meaning of which has been variously interpreted.[15]

More than a month elapsed from the time that Columbus first landed at Cape St. Nicholas, the extreme northwestern point of Haiti, until he had completed exploration of the 400 miles of its northern coast and entered the Bay of Samaná in January, 1493. In the meantime he had suffered shipwreck of one of his caravels, the *Santa Maria*, near Cape Haytien. The large native village of Guarico was located about 2 miles from the scene of the shipwreck. Goacanagaric, the cacique of the northern native Province of Marien,

[15] The term "cannibal" originated through a mispronunciation of the Indian name Kalina, or Carina and Caripuna, later corrupted into the term Carib by the transference of the letters *l* and *p* into *r* and *b*. The island of Haiti was also referred to as Quisqueya—that is, the mainland. The native Arawak term Aiti, or Haiti, appears also to have been generally applied to the island by natives speaking the Arawak language. Haiti signifies mountainous country or high land, and in this sense the term was also applied to a subprovince of eastern Magua. The native name Cuba became Juana to the Spanish, and the island of Boriquen was renamed Porto Rico. Haiti gradually became known by the same name which the Spanish had given to their capital city, namely, Santo Domingo. Columbus had renamed the island of Haiti Española. This word was later corrupted into Hispaniola. Modern practice is to again use the native term Haiti when referring to the entire island but to apply the term San Domingo when referring to the Dominican Republic.

lived there and soon became the friendly adviser of Columbus and of the Spanish.[16]

The Taino cacique Goacanagaric told Columbus that Caribs had frequently made attacks on his people and had carried away captives. When on such raiding expeditions the Caribs were armed with bows and arrows. The offer of Columbus to protect the people of Goacanagaric from the invasions of the Caribs was enthusiastically received. This fear of the Caribs formed the basis of a lasting friendship between Goacanagaric and Columbus. At the island of Tortugas, not far off the Haitian coast, and the village of Guarico, and just nine days before Columbus was shipwrecked, the Spanish saw evidence of the presence of the roving Carib. Later, as they sailed eastward and approached the Lesser Antilles, additional evidence was discovered.

When Columbus with his two remaining ships, the *Pinta* and the *Niña*, rounded Cape Cabron and anchored in Samaná Bay on the 13th of January, 1493, he encountered natives as hostile as the natives of Marien under Goacanagaric had been friendly. It is possible that the tactics employed by Martin Alonzo Pinzon, who commanded the *Pinta*, were responsible for the hostility on the part of the Ciguayan Indians of Samaná. He had taken four native men and two girls from the vicinity of Porto Caballo aboard the *Pinta* to be later sold as slaves in Spain. When Columbus discovered what had been done he made restitution and returned the captives to their village, with gifts, but the news of the capture preceded them. The easily hostile Ciguayans of Samaná simply anticipated a raid on the part of the Spanish resembling that with which they were familiar from the Caribs.

Columbus thought that as the Ciguayans were hostile and appeared quite different from the peaceful subjects of his friend Goacanagaric of the north coast, they must be representatives of the dreaded Carib. An Indian was induced to come aboard the *Niña* where it was anchored in Samaná Bay near the present town of Santa Barbara de Samaná. This Indian intimated that the island of Carib (Porto Rico) lay to the east. Columbus gave several presents to the Indian, among which were two pieces of red and green cloth and some small glass beads, and sent him ashore. When approaching the shore in the ship's longboat more than 50 armed Indians were discovered lurking in the thickets. The Indian who had been aboard the *Niña* pursuaded the Indians to come out from their ambush and to lay down

[16] "The locality of the town of Goacanagari has always been known by the name of Guarico. The French first settled at Petit Anse; subsequently they removed to the opposite side of the bay and founded the town of Cape Francois, now Cape Haytien; but the old Indian name Guarico continues in use among all the Spanish inhabitants of the vicinity." Washington Irving, Life and Voyages of Columbus, vol. 3, p. 227.

their weapons. Two bows were purchased by members of the crew, two others having previously been purchased from the Indian who had been aboard the *Niña*. The natives soon took alarm and rushed to their weapons. The boat's crew defended themselves and wounded two of the natives, but were restrained by the boat's pilot from inflicting further injury on the Ciguayans and urged to return to their ship. This hostile encounter occurred on Sunday the 14th of January, 1493. The following day the Indians, who had fled when the Spanish had wounded two of their number, returned in large numbers. Their cacique, Mayobanex, was with them, together with three of his attendants. The Indian who had been aboard the *Niña* the day before again came aboard with the cacique Mayobanex and his attendants. Columbus invited them to lunch with him on honey and ship's biscuit. The cacique Mayobanex presented Columbus with a necklace of shell beads before being rowed to the *Niña*, and on his arrival at the ship Columbus gave him and his attendants red caps and bits of cloth and beads. When Mayobanex returned to his village on the north shore of the peninsula the following day he sent to Columbus by messenger a "coronet" of gold.

Because of the hostile attack of the Ciguayan Indians with their bows and arrows on the 14th of January, Columbus named the small bay where he lay at anchor the "Bay of Arrows" (Golfo de las Flechas). Tradition places this bay a short distance eastward from the town of Santa Barbara de Samaná, on the north shore of Samaná Bay. The inlet is still named "Golfo de las Flechas." The bows used by the Ciguayan Indians of Samaná were of a hard wood, black in color, probably lignum vitae. The bows were reported to be almost as long as those used by the French and English archers. Arrows were provided with foreshafts of hard wood which were attached to reed shafts about 1 meter long. The foreshaft was hardened in fire and tipped with a fish tooth or bone splinter and then dipped in a poison. Some writers speak of the natives of Samaná as having had spears like poles, long and heavy. Their war club was a sword-club of hard palm wood, flat in section, and must have resembled the typical war club still used by the Indian tribes of the tropical lowlands of northern South America.

The costume of the Samaná Ciguayans was negligible. The hair was worn long and tied in a bunch at the back of the crown of the head, giving an effect "as the women of Spain wear it." Plumes of parrot feathers and of other birds were inserted. No mention is made by early writers of a headdress of feathers arranged in the form of a crown wherein each feather was attached at the base of the quill to a woven band. This form of headdress is characteristic of the Arawak and Carib Tribes of northern South America.

The Ciguayan Indians of Samaná were so named because of their long hair, "ciguay" in Arawak speech meaning "long-haired." With respect to their hirsute adornments, the Ciguayans resembled more the Timucuans of Florida as represented in a drawing by Jacques Lemoyne de Morgues.[17] Other accounts speak of the Ciguayans as wearing a half crown of upright feathers inserted at the back of the head as the warp or passive element in a woven headband. This form of headdress occurs far in the interior of South America among the interior Arawak Tribes.

Columbus took with him to Spain from Samaná four young male Ciguayans who were to serve as guides and to point out the islands occupied by the Caribs. He sailed from the Samaná Bay on the 16th of January, 1493. On the 12th of November of the same year he returned and set ashore at Samaná (locality indefinite) one of the four Ciguayans who had made the journey to Spain with him. The released Indian was supposed to convert the Ciguayans to the Catholic faith and to tell the natives about the wonders of Spain. At Port Angeles a group of Ciguayans, some wearing necklaces and earrings of gold, came aboard with their canoes to barter their canoe load of provisions. They related, through interpreters, that their cacique wanted to know who the Spaniards were and to invite them to remain and trade for gold and provisions.

Later, after circumnavigating the island, he found the natives of Higuey—that is, of southeastern Haiti—as hostile as had been the Ciguayans, and, like them, also threatening to bind the Spanish with ropes. Also on the north coast, at La Navidad settlement, near Monte Cristi, returning from Spain on his second voyage, Columbus found two dead Spaniards bound with native ropes.

It appears that the only serious hostilities between the Spanish and the Ciguayans of Samaná Peninsula, other than the initial skirmish which occurred when Columbus first landed at the Bay of Arrows in January, 1493, was due to the loyalty and hospitality of the Ciguayan cacique Mayobanex to Guarionex, cacique of the native Province of Magua (Cibao Valley). Guarionex had conspired with Roldan and other Spanish deserters to overthrow the power of the adelantado Bartholomew, the brother of Columbus. When forced to flee to the mountains of northeastern Haiti by a punitive Spanish force, Mayobanex received the fugitive at his village near the mouth of the San Juan River near Cape Cabron, on the north coast of the peninsula.

With aid received from Mayobanex and his Ciguayan warriors, Guarionex made desultory warfare on isolated parties of Spanish soldiers and on native villages which had not joined the revolt. In

[17] Smiths. Misc. Coll., vol. 81, No. 4, fig. 1, p. 6, by David I. Bushnell, jr.

the spring of 1499 the adelantado Bartholomew, with 90 men, some cavalry, and a body of 3,000 loyal Indians from the Province of Marien, took the field against Guarionex and Mayobanex. Ciguayans and other hostile Indians encountered along their route across the Cibao Valley were easily repulsed by the Spanish. The Ciguayans repeatedly discharged their arrows wildly because of their fear of the Spanish and then ran to cover in the mountains.

A treaty of friendship was proposed to Mayobanex with the offer of protection if he would surrender Guarionex. Mayobanex replied that the Spanish were bad men and that he did not wish their friendship, while Guarionex was a good man and his guest. The Ciguayan subjects of Mayobanex wished him to surrender the fugitive to the Spaniards, who now had overrun the entire Samaná Peninsula. This Mayobanex would not do. Bartholomew Columbus now advanced along the north coast eastward as far as the cacique's village at San Juan, near Cape Cabron, where Mayobanex and his warriors were waiting. Many of the subcaciques now deserted Mayobanex, who retired into the mountainous country of the interior. Guarionex also wandered about the secluded mountains of the peninsula practically deserted by all his followers. All the natives had fled to the mountains and their villages remained deserted. The Spanish invaders were compelled to live on cassava bread, roots, and an occasional rodent of the genus *Plagiodontia* (jutia). These small mammals were rapidly nearing extermination because of the ease with which they were hunted. Because of the hardships of the expedition, many of the Spanish soldiers deserted and returned to their plantations in the Cibao Valley near Concepcion. The adelantado, with 30 men, remained. After a prolonged hunt, two followers of Mayobanex were overtaken and were forced to point out the hiding place of their cacique. Twelve Spaniards volunteered to capture Mayobanex, stripped themselves of their clothing, and stained and painted their bodies to resemble those of the Ciguayans. After they had covered their swords with palm leaves they were led to the refuge of Mayobanex and his family. His wife, children, and attendants were with him. These were made prisoners by the Spanish, who now gave up the search for Guarionex and returned to Concepcion.

The sister of Mayobanex, his wife, and members of the household were later released by the Spanish, who continued to hold Mayobanex in captivity to insure peaceful relations with the Ciguayans. These Indians now looked upon Guarionex as the cause of their cacique's difficulty and betrayed his hiding place to the Spaniards. Both Mayobanex and Guarionex were now held captive and Bartholomew could return to the capital at San Domingo City.

During his second voyage Columbus began the practice of sending natives of the island to Spain to be sold into slavery. Tribute was exacted from the remainder. The tribute levied was to be in gold, but an arroba of cotton—that is, 25 pounds—was later substituted as the quarterly tribute levied upon all adults over 14 years of age. As cotton was not grown throughout the island, and as it was practically impossible to obtain gold elsewhere except in the central mountains of Cibao, service was accepted instead of gold or cotton. This was in the year 1496 and was the beginning of the repartimiento, later to be expanded into the encomienda system, under which natives of the conquered island were divided among the Spanish soldiery for administrative purposes, principally for collecting the tribute.

Under this arrangement the Indian population of the island rapidly decreased. It is probable that to-day not one pure-blood descendant survives of the comparatively dense native population at the time of the discovery. Native language survives in the names of rivers, places, trees, and fruits. A sufficiently large vocabulary has been preserved to identify their early connection with the Arawak of South America.

SOURCE MATERIAL FOR STUDY OF ETHNOLOGY OF SAMANÁ

The several publications of the Hakluyt Society, the narratives collected in Churchhill's collections of Voyages and Travels, and the writings of early Spanish authors of varying merit—all have been studied by modern historians and ethnologists, as Washington Irving, Dr. J. Walter Fewkes, and others. Washington Irving's Life of Columbus, first published in 1827, was inspired by the publication by Martin Fernandez de Navarrete of previously undiscovered documentary source material. Select Letters of C. Columbus, published by the Hakluyt Society in 1847, is valuable principally because of the letter of Doctor Chanca describing Columbus's second voyage. Selections from the will of Diego Mendez, in which are related events which occurred during the fourth voyage of Columbus, are also valuable. The narrative of Ferdinand Columbus in the nature of a biography of Christopher Columbus, appears in the second volume of Churchill's Collections of Voyages and Travels. This account is particularly useful with regard to the ethnology of the Ciguayan Indians of Samaná. In the same volume of Churchill's Voyages appears the excellent monograph of Friar Ramon Pane, a Franciscan monk, who accompanied Columbus on his second voyage and was detailed by him to describe native religious and ceremonial life.

Peter Martyr's Eight Decades, or De Orbe Novo, is best available in Francis Augustus MacNutt's translation from the Latin and ap-

pears in two volumes. The first Decade was published in 1511 and is drawn from accounts and observations of Andreas Moralis, who was sent by Governor Ovando, the successor of Christopher Columbus as governor of Haiti, to explore the interior of the island. Much of Martyr's work is pure gossip, for he admits that everyone who had been to the Indies visited him. It is therefore unreliable, but so far as it follows Moralis appears to be authentic.

Fernandez de Oviedo y Valdez published his Natural History of the Indies in 1526. Jefferys, in his Natural and Civil History, published in London in 1760, follows Oviedo throughout in his descriptions of the natives of Haiti. Oviedo was living in Haiti shortly after Moralis explored the interior. A French edition of Oviedo was published in Paris in 1556. Jefferys writes there were but 100 natives still living in Haiti in 1730 and but 4,000 in 1550.

Girolamo Benzoni visited Haiti in 1541 and spent 14 years there. His book, the History of the New World, had been translated and was published by the Hakluyt Society of London in 1857. Benzoni lived the simple life while in Haiti, even to the extent of making his own cassava bread. His observations are therefore first hand.

Charlevoix published his Historia de l'Isle Espagnole in 1730. It is supposed that Charlevoix also borrowed from Oviedo. Charlevoix's map, showing location of native Provinces, is particularly valuable.

Bartholomew de Las Casas is the apostle of the decline of the native population and the principal accuser of Spanish misrule. Of all his numerous writings, the two most important in American history and West Indian ethnology are the Historia General and the Historia Apologetica de las Indias. Las Casas tells that he began this latter work in 1527 while living in the Dominican monastery near Puerto de Plata. It was not until 1875 that a complete edition of these two works appeared in the Spanish press.

Herrera's book, published in 1601, is to a great extent extracted from the larger works of Las Casas. Both of these writers make repeated reference to the Ciguayan Indians of Samaná. In the Journal of the First Voyage of Christopher Columbus appear in detail the first-hand impressions of the admiral. This is a rather complete account of his contacts with natives of Haiti, among them those of Samaná. Las Casas had access to it when he wrote his history. He gives a full abstract, which was condensed by Herrera. The Hakluyt Society published the Journal in English in 1893.

MATERIAL CULTURE OF THE INDIANS OF SAMANÁ

The material culture of the Ciguayan Indians of Samaná is South American in origin and, in a general way, in content. Relationship is with the agricultural peoples of the tropical lowlands of the

Guiana and Venezuelan coasts. It is in agriculture that the essentially South American culture elements reappear throughout the native provinces of Haiti. The Ciguayans maintained that they had originally occupied caves in the island, but that some of their number had come from the island of Martinique in canoes. This somewhat vague tradition must be accepted as merely unauthenticated folklore, unless we assume that their culture changed materially since their reputed emergence from the cave habitations. No group of Ciguayan Indians are known ever to have occupied caves as their principal habitation sites.

Antillean tribes had retained or borrowed the elements of cassava culture from tribes of southeast South America, where it continues to be characteristic of the area. The making of bread from the cassava plant (*Manihot utilissima*) and the making of vinegar from its juices, used as a seasoning for the pepper-pot, was introduced from South America. In the West Indies the culture of cassava was subjected to environmental changes. The fact that cassava and not maize was the principal food of the aboriginal population of Santo Domingo is significant of the antiquity of South American culture influence rather than of Mexican culture origins.

Pottery was brought to the islands and there developed into artistic forms not known in the pristine home of the island Arawak. Stoneworking became especially developed in Porto Rico and in Haiti and in certain islands of the Lesser Antilles, but this art appears not to spring from any South American focus of Arawak or Carib culture. It is rather a special growth affiliated with Mexican or Central American art. The Carib-Arawak of the Guianas and other parts of South America remain in a prestone age grade of culture peculiar to the tropical forest and savanna tribes of South America. The West Indies are not repressive areas like the overpowering forests of South America, but include drier areas where agriculture is practiced to advantage.

Culture development in the Greater Antilles does not express itself so much in an additional number of culture elements as in local embellishment of form. This is especially noticeable in pottery and in the sculptor's arts as applied to religious motives. It is possible, too, that Cuba, Haiti, and Porto Rico were subjected to influences in pottery production from North America. The hand-molded anthropomorphic heads and figurines in clay are essentially West Indian in form but Central American in origin, their nearest prototypes being the anthoropomorphic figurines on ancient Chirique ware from Panama. Unpainted pottery was brought with the island Arawak from South America and many later contacts have stimulated the production of pottery after the fashion of South American ware.

Griddles for baking cassava are South American, even with regard to form, while the typical North American stone mortar "metate" for the grinding of corn is apparently lacking in the West Indian culture complex. Whatever archaic forms exist in native Tainoan earthenware—that is, open pottery vessels with clay figurine heads mounted at the ends and facing inward, likewise the peculiar punctated decorative designs, and several of the peculiar arrangements of luted ribbons of clay to represent eyes, mouth, and other facial features—all these features in pottery decorative design need not as a matter of course to have come to the Greater Antilles by way of the Venezuelan and northeastern South American coast, but might far more reasonably have been introduced by a less circuitous route from Central American culture areas direct. Life forms modeled and employed in embellishment are, on the other hand, peculiarly endemic or West Indian in type. A tendency toward a conventionalized treatment of realistic models of animal and bird heads indicates presumably a long period of isolated development of forms and shaping technic.

Symbolism also has an important place in the designs incised on stone, bone, and wood sculptures, also in painted designs. In their decorative designs, the incised figures are well suited to the space they are intended to occupy. Characteristic is the ornamentation of a space in which a central pit is surrounded by a circular incised line or a raised band which in turn is surrounded by a series of broken circles, the corners between these broken circles being filled in with triangular or other angular linear incisions.

Culture diffusion in the West Indies.—The connection of the island Arawak with Floridan tribes was essentially one of trade and provisioning. Transference of decorative designs, therefore, was incidental to trade contacts. It is nevertheless true that the broken circle is typical of the southeastern Atlantic States and occurs also elsewhere in North America, but the penetration of Floridan designs within the Greater Antilles remains an obscure problem.

Peter Martyr mentions a species of tree in the Lucayan Islands[18] where many pigeons nest. Indians from Florida came to catch these pigeons and carried boatloads back with them. In Guanahani the Indians knew of a land lying northwest of the Bahamas; also, in Cuba, natives knew of a land mass on the north. Just what relationship existed in the making of coonti flour in native Florida and cassava flour in the Greater Antilles remains uncertain. Methods employed in the production of the root flour are similar and the stages of bread manufacture run somewhat parallel. It is possible that many other examples of Floridan and Antillean culture rela-

[18] De Orbe Novo, p. 251.

tionship might be cited and traced to a common origin. For instance, the common conical pottery bowl occurs throughout the southeastern States as far west as Texas, petaloid celts as far north as Georgia, and pottery decorative designs of Antillean type widely throughout the southeastern States. The palm thatched house of the Seminole Indian apparently is identical with that of the Arawak of the Greater Antilles. An analogous culture unit of a somewhat different type might be seen in the rough flat shell beads, shell gouges, and shell dishes of the key population of southern Florida and of the coast fishermen of Haiti and Cuba. In mentioning such culture similarity as significant it must be taken into account that the cave dwellers of Samaná, who were also fishermen, were in possession of the same meager culture.

Within the unit of the Greater Antilles was the strengthening bond of a common speech. Columbus observed that Arawak speech was understood as far west as Pinar del Rio Province in Cuba, as far north as the Bahamas, where it was the common speech, and as far east as the Carib islands of Dominica and Guadeloupe. He also discovered that the natives of Cumana and of Paria, on the Venezuelan coast, knew of the existence of the island of Haiti and of Haitian and Porto Rican gold. They also knew of the Mona Passage between Santa Domingo and Porto Rico, which was in daily use by the residents of both islands. The several centers of native craftsmanship, as the carving industry which flourished on the island of Gonave, has been referred to. Las Casas unites that one type of customs prevailed throughout the island of Haiti. Although several local dialects were noted, this did not interfere with their being understood to any considerable extent by natives throughout the entire West Indian Archipelago, with the exception of the Caribs who occupied the Lesser Antilles. The son of Goacanagaric, cacique of Marien on the Haitian north coast, easily conversed with native women from Porto Rico (Borinquen) who had been rescued from the Caribs by Columbus. Columbus was responsible for the statement that native barter extended throughout the archipelago and included stools, gold, dishes, and other pottery vessels, and carvings. The wares the Arawak of Cuba wished to barter with the Spanish consisted of food and provisions, cotton, yarns in balls, and parrots. Doctor Chanca says that gold, provisions, and other objects of native barter were gladly exchanged for beads, laces, pins, and glazed dishes from Spain.

Native intercourse with Yucatan was probably limited to a few trading voyages, and that but recently, as there is no evidence as yet at hand that the far higher culture of the Maya had influenced that of the island Arawak of the West Indies. The cakes of beeswax

mentioned by Columbus as having been seen in a native hut in Cuba and also observed by Las Cases in Cuba before Yucatan had been discovered by the Spanish are, after all, too slender a foundation for the linking up of pre-Columbian trade between the Arawak of the West Indies and the Maya of Yucatan.

But Central American influence is noticeable in the presence of maize culture in the Greater Antilles to the limited extent that it did exist, also in the extensive use of cotton. Maize and cotton were the two important culture plants in Yucatan. Guarionex, cacique of the Magua (Vega Real), offered to plant cornfields extending from Isabella on the north coast of Haiti to the capital city on the south coast and to present the crops therefrom to the Spanish as a tribute in place of gold because his people did not know how to mine gold, although they did know the art of maize production. The fact that a levy of 25 arroba (pounds) of cotton for each adult could be made by the Spanish indicates the degree of native proficiency in cotton production.

The presence of stone collars within both areas, of stools of stone with sculptured anthropomorphic and zoomorphic figurine carvings, the presence of axially drilled tubular stone beads, the weaving of cotton cloth, the wearing of a woman's garment similar to Central American patterns, and, above all, the molding of clay figurines in anthropomorphic and zoomorphic designs—all these indicate a remote influence from Central America entirely distinct from a more direct influence from the Maya of Yucatan, which apparently did not occur. Most of the Arawak artifacts from Cuba have been recovered from the eastern end. If connection had existed with Mexico of the Mayan period, artifacts from western Cuba would have revealed such connection.

In a recent publication by Samuel K. Lothrop [19] there appears the following discussion relative to Central American influences on the native culture of the Greater Antilles.

> The chief culture bearers in eastern South America belonged to the Carib and Arawak stocks, whose influence can be traced from the Parana Delta in Argentina northward across the Antilles to Florida. At the time of the conquest they occupied the Guianas, Venezuela, and the Antilles, but their original home must have been farther south, perhaps in southwestern Brazil. The ceramic remains of this culture are chiefly broad bowls, sometimes with incurved rims, decorated by incising, by geometric patterns in red paint, or by the addition of small modeled figures to the outer walls of the vessel.
>
> It is the belief of the writer that this culture had a distinct connection with southern Central America. This belief is founded upon the fact that the red-line ware patterns and also some of the small-modeled figures in stone cist ware of Costa Rica have a distinct Antillean flavor. In addition, pictographs from the two regions are surprisingly alike, while the chairs of the present

[19] Pottery of Costa Rica and Nicaragua, vol. 2, p. 410.

tribes in South America resemble those of the Guetar. For geographical reasons direct contact between these areas was impossible and those features which are common to both were doubtless passed along by the natives of Colombia.

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From the foregoing * * * no statement as to dating can be made at present, which is other than a more or less well-founded guess. We have demonstrated the artistic and technical affiliations of the ceramic remains. The chronological ordering of this array we leave to be determined by the ultimate and conclusive proof of excavation.

Weapons.—The Ciguayans of Samaná were true Arawak in their type of arrows. This applies particularly to the trident and war arrows. Their bows, however, were like those of the Carib, in that they were very long and fashioned from the heartwood. Their clubs were like those from the Guiana coast, having a truncated, bulbous end section, the entire weapon being smoothly polished. Their method of fighting with ropes resembles that of the Velez of Colombia, although the custom of binding prisoners with ropes apparently was general throughout the entire island. Ciguayans used to paint themselves with the red color extracted from the *Bixa.* This was a war paint commonly used. The black paint with which they also smeared themselves in preparation for battle was derived from a pearlike fruit, the *Genipa*, which they are said to have cultivated in their gardens. The throwing stick and arrows of *gynaerium* are also typical of the South American Arawak.

The variety of weapons employed by the primitive Ciguayan at the time of the discovery is worthy of note. When Columbus landed at Guanahani, in the Lucayan Islands, he found the inhabitants armed with wooden spears, the tips of which were hardened in the fire or tipped with the spine or tooth of a fish. The same type of weapon is said to have been in use also by the Ciguayans. There were, however, other weapons. The Ciguayans also were found using the same form of fire-hardened javelin or spear. The bows "of hardwood almost as big of those of England and France" were noted both in northeast and in southeast Santo Domingo. Similar long bows also were in use by the Porto Rican natives of the interior. Slender reed arrows were fashioned from the *gynaerium*, having a hardwood foreshaft tipped with a fishbone or bone splinter. There appears to have been no general use of poison by the natives of Haiti, although the tribes of northeastern and of southeastern Haiti dipped their arrows in a vegetable poison. In this custom they appear to have followed their neigbhors, the Caribs, rather than the Arawak of the Greater Antilles generally. No bows and arrows were found by the Spaniards in Cuba, Jamaica, or in the Bahamas.

In Haiti darts with reed shafts and fire-hardened wooden points were hurled with spear throwers. It is assumed that this weapon

was known and used by the Ciguayans, although no specific mention of the fact is to be found in the literature. The heavy sword-club "macana" of the Taino or "butu" of the Carib was much in evidence among the Ciguayans of Samaná. This weapon was of heavy hardwood, flat, and blunted at the edges. It was more than an inch in thickness throughout. The Porto Rican "macana" was as long as a man's stature; it was provided with a bulbous hiltlike protective device, which in the Carib varieties was sometimes inlaid with bone or wood of another color. No defensive armor or shields were used north of Paria, on the mainland of the Venezuelan coast. Columbus saw a native canoe off the coast of the island of Trinidad, the crew of which was armed with bows and was in possession of shields. Trinidad is typically South American also with respect to fauna. Although the bow had penetrated the West Indies as far north as Haiti, the use of the shield had not yet advanced beyond Trinidad. The Carib was instrumental in bringing the bow to the Antilles, as no bow was found to be in use by the natives of the Bahamas, Jamaica, or Cuba, and those portions of Haiti which the Caribs had not yet reached in their raiding expeditions. There the dart and spear thrower were still the essential projectile weapons.

War clubs of stone resembling stone axes were used by the Carib as tools and ceremonially as weapons by their caciques and headmen. Such axes were used as weapons in a hafted form. When held in the hand, as a hammerstone is used, without the aid of a haft, the stone object was used as an implement only in much the same way as is the polished stone celt. It is not known, however, that hafted petaloid stone celts were ever employed other than as peaceful implements. The entire question of the presence of a hafted stone war club in the Antilles is problematical even with respect to the Carib.

Although many hammerstones and notched and flaked stone objects resembling the more finished Carib stone ax were recovered by the Museum expedition in Samaná, no single object of the nature of a stone weapon of any description was uncovered.

Habitations.—The dwellings of the Island Arawak resemble those of the more highly developed tribes of tropical South America. The dwellings of the Florida key fishing tribes, so far as we know, were of the same type and were not like the pile dwellings of a more specialized building technique peculiar to the South American river deltas. The less developed of the Haitian and Cuban tribes lived in caves. Later, on emerging from their cave structures, natives of Haiti developed two types of house architecture. In one type a circle of poles was forced into the earth, each pole separated from the others by 2 or 3 meters distance. Between these poles were lashed with rattan sections of palms or canes. Transverse beams resting on the

upright poles supported the roof poles, which were so placed as to converge like a cone. Slats were lain upon the roof beams and thatched over with grass or palm leaves. A center pole extended from the apex of the roof to the center of the floor of the hut. This was the smaller type of house structure.

The cacique's house was a rectangular structure, but was constructed of the same materials. Instead of a conical roof there extended a ridgepole from one side of the house to the other. The ridgepole was fixed in position by forked house posts. A lean-to extending from the roof of the main structure was really an open porch, such as may still be seen in the country throughout the island.

The furniture of a native hut was meager. It provided for the needs of daily life and for religious objects required in times of crises. Domestic requirements came first and were filled by earthenware vessels of varied description, an open fireplace with a supply of heating stones, cassava griddles of earthenware, seats of carved wood, hammocks, and a meager supply of articles of woven cotton cloth and netting. The hammock was chair, couch, and bed, and cradle as well. The principal varieties were woven or netted. The woven hammock was essentially a piece of woven cotton cloth, while the netted hammock had a framework to hold the openwork looped netting in position. Hammocks were slung out of doors on the porch. In colder weather they were slung inside the house, while a fire was kindled underneath. Sleeping on the ground was common. An improvised bed of plantain leaves was then prepared.

Stools were of primary importance in Haiti. The stools ("duhos") were graded according to the rank of the user. Important men sat on artistically carved wooden stools. Stone stools and those of carved woods were to be found in the houses of the caciques. Simple wooden stools were of the generalized South American and Central American type, in which a concave seat, together with four short legs, were cut from the solid log. A step beyond this and still a common form was the wooden stool with flat or slightly concave but unpolished seat, four flexed stumpy legs, and an anthropomorphic or zoomorphic head cut out of the front end of the seat, while a stumpy tail projected from the rear. A still more elaborate form provided for decorative embellishments in the form of paneled inlay with shells or gold, while the upward concavely arched tail or back rest was elaborately etched with decorative designs in spirals, triangles, and rectilinear motives. The ceremonial use of this form of stool was noted by early Spanish writers. The legged stone stools with concave backs were also used as mealing stones, "metates," the regular form of the metate not occurring in the Greater Antilles. The stool form of the metate often was provided

with figurine heads similar to those of Costa Rica, Panama, and elsewhere on the continent. No report is available concerning the construction of stools of Trinidad, Paria, and the adjacent South American coast.

It appears that the best stools were found by the Spanish in Xaragua, in southwestern Haiti. The workshop was on the island of Gonave. So far as is known, not one object of native manufacture presented to the Spanish by the native caciques of the time has ever found its way into museums or is at all extant to-day. No stone "metate" stools, wooden stools, or other object of native furniture of a practical nature other than objects of pottery were recovered by the Museum expedition. Earthenware objects were, however, picked up almost at will.

Relative importance of hunting and fishing.—The food supply of the natives of Samaná varied in accordance with the food-collecting habits of the various groups. Investigations by the Museum expedition established a wide range of food resources for the several sites explored, the former occupants of the caves on the south shore of the bay being primarily gatherers and collectors of shellfish, snakes, rodents, fish, bats, worms, birds, or whatever natural produce came to hand, while at Anadel, on the north shore, bird, fish, and animal bones were in greater abundance. The large number of jutia mandibles and skulls uncovered at Anadel and San Juan indicate a dependence on hunting as a food resource. Anadel is but 15 kilometers northeast of San Lorenzo Bay and the caves of the Playa Honda coast. It is therefore not unexpected to find in the upper culture stratum of the caves a predominance of fish and small mammal bones over the deposits of the remains of shellfish as conch, clam, and oyster shells which predominated in the lower culture stratum of the cave middens. It is also possible that the pre-Ciguayan cave population later merged with the Ciguayans who came over from the north shore and there developed a modified form of Tainoan culture which was dependent on fishing rather than on the cultivation of the yucca as a food resource. Doctor Abbott found a species of jutia (*Plagiodontia hylaeum*) still living in the forested lowlands of the south shore of the bay, although the several forms of small mammal life still in existence at the time of the discovery in eastern Haiti soon became practically extinct after the arrival of the Spanish, the disruption of native culture, and the introduction of slavery.

In general, it may be inferred that fishing rather than agriculture was the chief support of the Ciguayan population of the narrow peninsula of Samaná. The find of several stone pestles and of fragments of circular earthenware griddles for baking cassava bread indicate a dependence on agriculture and the cultivation of the cassava (*Mani-*

hot utilissima) as well. Cassava griddles were also uncovered from the upper culture stratum at the "Railroad" cave. The presence of small groves of calabash trees in the sheltered ravines along the south shore has been previously referred to. Large plantations of food crops were observed throughout the Greater Antilles at the time of the discovery, particularly, however, in the drier areas where irrigation was utilized. Planting of fruit trees and cultivation of food-producing plants was possibly less extensive in Samaná than elsewhere in aboriginal Haiti.

Benzoni, in his History of the New World, says that bread was made both from maize and from cassava (manioc). Women wet the grain in the evening with cold water. The following morning they triturate it between two stones. The resulting meal is mixed or kneaded with water, which is then shaped into small round or oblong loaves. The loaves are then placed on the flat earthenware griddles and baked. This bread easily mildews, but is supposed to have been eaten while fresh. Bread of a better quality was made from corn, which was triturated between two stones, washed, and cleaned of husk particles. The corn meal was ground exceedingly fine before being shaped into small round cakes. The cakes were then cooked in a pipkin over a slow fire.

Benzoni writes that the Spanish also were at times compelled to eat native cassava bread, which they loathed. "Whenever, through the arrival of the ships being delayed, they can not get bread, they are obliged to eat the cassava, for they do not cultivate much maize, as they generally have the other sorts of flour.[20]

Benzoni's statements relative to maize culture in Haiti are explicit and are therefore invaluable. The "caingin" system of tropical agriculture prevailed. Fields were cleared by burning off the forest growth and then by planting in the ashes. Benzoni says that the "earth is not otherwise prepared for the planting." A small hole was made in the soil, into which were inserted three or four grains, which were then covered over. Planting in some of the native Provinces of Haiti was repeated during the year. Benzoni naively observed that on account of the great hardness of maize the grinding of it was very hard work which "did not suit my arms that were very weak and thin." Plantains and bananas were probably native to the island at the time of the discovery, as were also yams and species of sweet potato.

Chicha, an intoxicating drink, was made from maize. Women prepared the ingredients by immersing a quantity of ground meal in water placed in large earthenware jars. When softened this was chewed and thoroughly mixed with saliva by the women, who then

[20] History of the New World, p. 91.

placed the concoction with leaves in jars or cooking pots and boiled it for three or four hours. When cooled it was strained through a cloth and was "esteemed in proportion as it intoxicates."

Irrigation was not necessary in humid Samaná, as cassava and maize ripened without much attention on the part of the primitive "tillers of the soil." Irrigation has not been reported from Porto Rico, but was extensive in the southeastern Province of Haiti, in what is now the Haitian Province of Jeremie, then Xaragua. Irrigation trenches have also been observed in Cuba.

In the culture of the cassava root (*Manihot utilissima*) more care was required than in the planting of maize. This additional care was due to the poison (prussic acid) contained in the roots when untreated, also to the necessity of producing enough slips of the root to obtain plantings. Like the cassava, yams and sweet potatoes were cultivated in mounds, while maize was grown in hills separated by the distance of a pace. A digging stick was employed in planting kernels of maize. The soaked kernels to be sown were carried suspended from the neck in a woven bag. It is noteworthy of the great extent of native plantings and of the advanced stage of agriculture in aboriginal Haiti that even in mountainous Samaná the caciques of the primitive Ciguayans, after their defeat by the Spanish, mustered 5,000 men, and as a peace gesture brought this body of men before the adelantado without their weapons but carrying fire-hardened digging sticks.

The Arawak agriculturist made his plantings in a cleared field in the forest. The savannas were unavailable because of the grasses, the tangled root masses of which he could not penetrate. The modern practice in Haiti remains as it was with the aborigines, to allow the open grasslands to remain uncultivated. Soil in the mountains is thin and stony, but the valleys have fertile soil in Samaná. Some of the best cocoa and coffee lands on the island may be found in Samaná, although the industry is stagnant. Practically no coffee or cocoa is produced for export. There are few new plantings, as the Dominican of Samaná feels he can not compete with the fertile lands of the Yuna Valley. This valley, that of the great Cibao, is traversed by the Santiago-Samaná Railroad, which, however, reaches neither Santiago or Samaná. An export trade in yams, plantains, yautias, and other tropical products has recently been developed whereby the merchants of Samaná supply the demand of former residents of the West Indies now living in New York. Samaná Peninsula remains almost entirely forested, although groves of coconut palms have been planted along the shore and on the lower terraces of the south shore, as also on the flat sandy shores of San Lorenzo Bay near Sabana de la Mar.

Hunting was limited, through the fact that there were no large animals. Hunting was of less importance than fishing. The jutia was hunted by burning the grass to drive it out. Communal drives were organized in the dry season only. Clubs were extensively used in hunting, and the small dumb dog frequently mentioned in the literature was also employed. These dogs themselves were eaten and, along with the iguana, were considered a delicacy. The iguana was stewed over a slow fire. An interesting feature was the development of an earthenware "chafing" dish exactly suited to this purpose.

Raw food was also consumed in the form of underdone fish, while worms, spiders, and grubs removed from rotting wood were eaten uncooked. Fire was made by friction. A set of fire sticks was carried by the native on his journeying.

Several ingenious devices and methods of catching birds were employed by the Taino of Haiti. In Cuba a captive parrot was used as a decoy to capture other parrots. A native equipped with a captive parrot, a noose, and an ambush of straw would climb to the top of a tree. When he touched the parrot's head, it cried out and attracted other parrots. The noose was slipped over the head of an inquisitive parrot, its neck wrung, and let fall to the ground.

Fishing and water transport.—Fishing was probably more developed among the Ciguayans than among the river tribes of the tropical lowlands of South America. New fishing devices and a development in the fishing gear of the Haitian natives is to be noted. Their use of fishhooks is mentioned in the literature, but the fishhook is not specifically described. It was probably fashioned of bone and was an instrument of one piece only. Like most sedentary tribes, the Taino were in the habit of visiting unsettled regions in conducting their hunts, or when fishing they visited uninhabited shores and islands. Large drawnets of finely woven cotton were fashioned and generally employed by the island Arawak but not by the Carib of the Lesser Antilles. The trident spear and 3-pointed arrow (multiple head), along with the use of poison, played a part in their fishing lor. A fishhook of shell was found by the expedition in Samaná.

A unique development in West Indian fishing technique was the use of the sucker fish (remorra). The powerful sucker developed on the upper side of the head is naturally used by this species of fish to attach itself to other fish. This was observed by the Indians, who developed this phenomenon to their own use. A remorra was captured alive, a cord tied to it, and then allowed to escape until it became attached to a large fish by means of its sucker. Both fish were then drawn in by means of the cord, the captured fish disengaged, and the remorra again set free to attach itself to another fish.

Fish preserves or inclosures fashioned by closely spaced reeds or poles forced into the shallow bottom of a lagoon were observed by the Spanish in general use at time of the discovery.

A group of bilaterally notched sandstone net weights may be seen in Plate 4. These weights have two notches placed in mid-section, with the exception of No. 2, where three well-defined notches indent the edges bilaterally and at one end. As the edges of each of these net weights have been shaped in part by flaking, it is possible that the flattened surfaces may also have been intended as points of attachment for net-suspension cords. The end sections of No. 2 have been so abraded through use that it is impossible to determine whether it might not have originally been used as an ax, similar to the grooved axes of the Caribs. Fracturing of the end sections may indicate secondary usage as a hammerstone. These net weights were uncovered at Anadel. They are of sandstone of a uniform thickness of 2 centimeters (0.8 inch) and a length of 10 centimeters (3.9 inches). Each of these objects has been given the Mus. Cat. No. 341052, U.S.N.M.

In Plate 2, Nos. 1, 2, and 3 (Cat. No. 341052, U.S.N.M.) are unusually small net weights, No. 1 being but 3.5 centimeters (1.5 inches) in length and 3 centimeters (1.2 inches) wide. Bilateral notches have been fractured. No other evidence of working or of use is apparent. No. 4 of Plate 2 is a hammerstone, roughly rectangular in shape and originally part of an oblong polished celt. It is much worn through use at the transverse edges and is fractured at the ends. It was recovered from the San Juan site. Dimensions: 4.3 centimeters (1.9 inches) long, 4 centimeters (1.6 inches) wide. This object is a good example of secondary use. It is remarkable that only a few unbroken petaloid celts were recovered along with the hundreds of fragmentary and broken examples. Most of the broken celts show evidence of use after the original fracturing. No. 5 of Plate 2 is another example of a stone celt which has been converted into a tool of another description. (Cat. No. 341018, U.S.N.M.) The larger end section shows many facets and some rechipping, enough to form a comparatively sharp perforating or cutting point. This specimen is one of the few objects uncovered at San Juan revealing evidence of rechipping. Dimensions: 5.5 centimeters (2.2 inches) long, 4 centimeters (1.6 inches) wide, 1.5 centimeters (0.6 inch) thick.

Native canoes in aboriginal Haiti varied in size, but each possessed the common quality of having been cut from a single tree trunk. Columbus wrote that "the dugout canoes of Haiti were of solid wood, narrow, and not unlike our double-banked boats in length and shape, but swifter." The Caribs of the Lesser Antilles were in the

habit of sailing to Porto Rico to obtain boat-building material, as the trees growing on the Lesser Antilles were not suitable for making large dugouts.

Fire-killed trees left to dry before felling were later felled by firing and then gouged out with stone axes after alternate processes of burning and charring to loosen the wooden fiber to be removed. The width of beam was increased by inserting beams of wood transversely at several points. A unique invention was the building up of the gunwales with a plaited bulwark of sticks and reeds knitted together with rattan and pitched with gum. Herrera described the canoes as "boats made of one piece of timber, square at the ends like trays, deeper than the canoes, the sides raised with canes, daubed over with bitumen." Use of sails and awnings, decorative designs in paint and carving—all were traits making the West Indian dugout canoe a highly developed invention. Paddles rather than sails were the ordinary means of propulsion. A long paddle having a crutch-shape handle was generally employed. Long voyages were not infrequent. For instance, three Lucayan Islanders escaped from Hispaniola and the bonds of Spanish slavery and attempted to sail back to the Bahamas. They were recaptured when they had practically completed their journey of over 100 miles. Bailing was accomplished with a calabash bail; also by rocking the boat.

Objects of shell and bone.—Both ornamental and useful objects were fashioned by the Ciguayan Indians of Samaná from varieties of shells. In the west Florida Keys shell picks and celts were shaped from the *Busycon* species, while in Haiti varieties of the *Strombus* species shell were so employed. Even objects of a religious nature were carved from varieties of shells obtained from the adjacent waters. The varieties of shell used in axes found on the coast of Yucatan again differ from those of Haiti and are smaller. Objects of personal adornment, as necklaces of shell beads, nose ornaments of turtle shell, and amulets, such as the small, beautifully carved personal amulets or zemis; inlay of shell particles on wooden seats and other household furniture; univalves shaped into cups, dishes, plates, and celts of the shoehorn variety—these are some of the uses to which native ingenuity put bivalve or univalve shells.

The use of conch-shell bowls, plates, or of domestic utensils of any description has been characterized as pre-Arawak. In Cuba this usage of shells in a purely practical and utilitarian manner has been termed "Ciboney" culture, hitherto not described from any of the other islands of the Greater Antilles. Quantities of shell bowls, plates, and of improvised utensils of several varieties similar to the "Ciboney" culture were found by the Museum expedition to be also characteristic of the cave culture of the south shore of

Samaná Bay. A disturbing element was the occasional find of unmistakably Tainoan pottery and implements in otherwise characteristically pre-Arawak shell middens. The deposition of many fragments of Tainoan pottery in the shell heaps within the caves was such as to preclude one's ignoring the significance of their position. But for these heterodox objects, the Samaná cave culture is a repetition of the Cuban "Ciboney" cave culture of Pinar del Rio Province and elsewhere throughout the island.

In Plate 7 are figured three large vessels shaped from large conch shells *Strombus gigas*. Two of these, 1 and 2 (Cat. No. 341064, U.S.N.M.), might conveniently be classified as having been used as plates, while 3 might be called a shallow bowl. Each of these vessels is so shaped as to rest firmly on two spires at one end and the convexly rounded shell wall at the other. No. 3 has no projecting spires; therefore has not feet. It is so shaped as to rest flat on a supporting surface, and so might readily serve as a container for liquids. The type of plate represented in 1 and 2 is quite common to each of the caves worked in the San Lorenzo area, while the shallow bowl figured as 3 is a more rare form. Smaller plates similar to 1 and 2 were also found at the open village sites of San Juan and Anadel, on the peninsula. No. 1 has a maximum spread of 11 centimeters (4.4 inches), while 2 has a width of 13 centimeters (5.1 inches). No. 3 is 6 centimeters deep (2.4 inches), while the plates figured as 1 and 2 are shallower.

That shell utensils were used almost exclusively in the caves of the San Lorenzo Bay area to the practical exclusion of pottery vessels of all descriptions is striking evidence of a culture type distinct from that of Samaná Peninsula, where vessels of pottery predominated to the practical exclusion of those shaped from varieties of shell. It is here assumed that we have in the Samaná cave culture an inferior culture antedating the Arawak type which is based essentially on pottery decorated with incised lines; polished stone celts; cassava culture, and the shaping of figurines in clay. We know little of the physical type or of the spoken language. The large quantity of human skeletal remains from the rock-cleft burials is for the most part fragmentary in nature.

No plates or containers shaped from large conch shells were uncovered at Anadel or at San Juan, although several gouges or celts of fossil conch shell were recovered there. Several large worked examples of the conch (*Strombus gigas*) shell with portions of the apex removed were discovered at San Juan. These had been used as musical conchs by the occupants of the site.

Mention should be made of a small shell plate figured as 4 of Plate 9. This interesting object was dug up at San Juan and is one of a

series of similar shell vessels accompanying child burials in another section of the midden at San Juan. (Cat. No. 341006, U.S.N.M.) With the child burial and the accompanying shell dish was a 2-compartment pottery vessel in red ware (2, pl. 14). Both shell dish and pottery vessel are unique in Tainoan collections. The shell vessel figured as 4 of Plate 9 is polished, regularly shaped by cutting, but is sharpened along the edge at one end to a knifelike thinness. The vessel might be called a spoon. Other shell vessels accompanying child burials at San Juan are flattened and are more distinctly intended as plates. No. 4 is 4.2 centimeters (1.6 inches) wide, 5.2 centimeters (2 inches) long, and 2.6 centimeters (1 inch) deep.

Several slightly worked large conch shells dug up at San Juan are possibly unfinished vessels.

Shell gouges and celts.—Reference has been made to fossile conch shell gouges and celts. These figured in Plate 8 were uncovered on the peninsula both at Anadel and at San Juan, one also from the cave at Boca del Infierno. With the exception of 3 (Cat. No. 341041, U.S.N.M.), the shell implements conform to the Barbados type referred to by Doctor Fewkes as the shoehorn type. This type is unusual elsewhere in the West Indies, although it appears again in the Floridan shell middens. Nos. 1, 2, 3, and 4 are entire and are semifossilized; 5 is broken off at the smaller end and is much more mineralized. It is therefore heavier than either of the others. All of the shell gouges from Samaná are, however, of the same general type. No. 4 was unearthed at San Juan; 1, 2, and 3 at Anadel; while 5 comes from cave 4 of the San Lorenzo area. These shell gouges were fashioned from the lip of large conch shells (*Strombus gigas*), smoothed to a celt form by crumbling and grinding, and provided with a semisharp cutting edge at the base of the wider end. Most of the convolutions of the lip of the shell remain unworked, as may be seen in 3, 4, and 5. In 1 and 2 these have been entirely ground away in obtaining the necessary bevel for shaping the cutting edge at the base. The largest of the shell gouges or celts collected, 4, is 19.2 centimeters (7.6 inches) long and 6.6 centimeters wide. It is possible that 3 is not a celt but had been used for another unknown purpose. Its edges have been worked to an oval contour, but the end surfaces have not been cut away to a beveled cutting edge. It may be an unfinished specimen. It is 8.7 centimeters (3.4 inches) long and 3 centimeters (1.2 inches) wide.

Several specimens of shell gouges were collected at Anadel. The large central whorl of the conch had been carefully removed by fracturing and the edges shaped to a roughly triangular outline. The cutting edge was obtained by grinding the basal end at a bevel extending from the base to the thick and narrow upper end. The

resulting tool makes an ideal scraper and supplies a fairly durable and sharp cutting edge. The larger specimen recovered is 10.5 centimeters (4.1 inches) long and 6 centimeters (2.4 inches) wide at the cutting edge. A smaller specimen is figured as 10, on Plate 9. In this specimen the beveled cutting edge has been fashioned from the smaller and thicker end. Thus the tool becomes an excellent perforator or pick. Another smaller specimen is figured as 9, on Plate 9. This diminutive shell celt is 9.5 centimeters (2.6 inches) long and 1.7 centimeters (0.7 inch) wide. These smaller shell celts, also the shell gouges, are from the Anadel site.

Ornamental uses of shell.—Gouges and celts fashioned from conch shell are characteristic of the material culture of the island Arawak of the Samaná Peninsula. They were much used for such work as dressing wooden stools after being charred by fire. Ornamental and decorative uses of shells of various species is no less characteristic of Tainoan culture. From the few specimens of decorative work in shell recovered from the vicinity of Samaná Bay, it is apparent that no distinction may be drawn in this respect between the Ciguayans of the peninsula and the other Arawakan tribes of aboriginal Haiti. If we disregard the element of phallic symbolism encountered elsewhere in the island, but absent from Samaná, the one significant element of distinction disappears. On Plate 9 are figured two examples of aboriginal decorative art in shell from Samaná. One, 8 (Cat. No. 341005, U.S.N.M.), is but a fragment of a discoidal pendant. Several perforations near the rim were made with a drill from one side only. These perforations are not evenly spaced—an irremediable lapse in native handicraft in aboriginal America. The shell pendant appears to have been uniformly oval. The fragment is 6.6 centimeters (2.6 inches) long and 0.2 centimeter wide.

Another effort at decorative art in shell may be seen in Plate 9, No. 5 (Cat. No. 341004, U.S.N.M.). This object was also of practical use as a pestle. It has been fashioned from the thick portion of the lip of a conch shell into tubular form, 1.5 centimeters (0.6 inch) in sectional diameter at the base, from which it is tapered to a diameter of 1 centimeter at the neck, where it is again expanded into a bulbous head, 1.5 centimeters in diameter. The tubular shell pestle is 4.5 centimeters (1.5 inches) long. No similar object is known from the West Indies.

On plate 9, No. 3 (Cat. No. 341003, U.S.N.M.), is illustrated another decorative object in shell, probably a pendant. This example of art in shell is from Anadel. Other examples, 4, 5, and 8, are from the San Juan site. It has been cut and ground to convexly flaring lateral edges, but the ends are straight. The reverse, which is not visible in the illustration, is concave and conforms to the natural surface plane of a conch shell. Three incised parallel lines have been cut

axialy into the obverse surface. Other incised curvilinear designs have been incised in the form of a crescentic panel parallelling other incised lines and reaching the lateral edges at the center. A bilaterally drilled perforation for suspension has been cut through the shell pendant near one end. Dimensions: 7.6 centimeters (3 inches) long and 3.5 centimeters (1.4 inches) wide at the center. It has a uniform thickness of 0.8 centimeter.

Aboriginal art work in shell from northeastern Santo Domingo is further represented in a series of perforated *Oliva*, *Ultimus*, and *Bulla* shells originally used as beads in necklaces. Several of the shell beads have transverse perforations. These are illustrated in Plate 10, Nos. 6, 7, 8, and 9. (Cat. No. 341062, U. S. N. M.) Perforations for suspension in each of these shell beads, with the possible exception of No. 6, have been made with a saw or grinding tool and have not been drilled as have the bilaterally perforated shell pendants.

An interesting observation regarding the transversely perforated Oliva shell beads is that they were found at each of the sites explored, except in the caves of the Playa Honda coast. Nos. 7 and 9 were picked up at the rock-cleft burial site at Upper Orange Key. The burials on Upper and Lower Orange Keys are several kilometers east, but are located on the same side of the bay as the caves of the Playa Honda coast. The absence of similar shell beads from the midden deposits in the caves does not preclude the supposition that the burials are those of the cave dwellers, nor does it preclude the supposition that their technic in shell so far as transverse perforation is concerned is identical with that employed by the occupants of Anadel and San Juan sites. Suspension perforations in Nos. 4 and 5 are small holes drilled at either end. They are similar to the tubular stone bead, 2, of the same plate. The average dimensions of the shell beads figured in Plate 10 are 2.4 to 2.8 centimeters (0.9 inch to 1.1 inches) in length, and 1.4 to 1.8 centimeters (0.5 inch to 0.7 inch) in section. This type of shell bead is typical of Tainoan culture and has been found in several localities throughout the Greater Antilles.

Swallowing stick of bone.—A fragment of a swallowing stick, used to produce ceremonial or religious vomiting, was dug up at the San Juan site. The object is the worked section of a manatee rib (*Trichechus manatus*). It has been shaped somewhat like a spoon handle with flat plain surfaces tapered to a truncated end section. Edges are smoothly rounded and the entire surface polished. The end section, usually decorated with figurine carving, had been broken off and could not be recovered. Dimensions: 7.7 centimeters (3 inches) long and 3.7 centimeters (1.6 inches) wide. (Cat. No. 341007, U.S.N.M.) It is figured as 7 of Plate 9.

Picks of conch shell.—Mention has previously been made of the quantities of small conch-shell picks from the kitchen middens in

the caves of the San Lorenzo Bay region. These picks are small, are crudely shaped from the outer lip of the conch (*Strombus pugilis*) and were undoubtedly used to extract the conch from its shell. Although merely an improvised tool, it is difficult to produce, as it must be struck off with a single blow. Skill must first be developed in striking the right kind of a blow to obtain the proper lines of cleavage in the lip of the shell and to obtain the characteristic shoe-button form of small hook at the thin end of the pick. After striking off about 50 picks in the manner supposedly employed by the aboriginal cave artificer, the writer gave up the attempt to obtain a characteristic form of shell-hooked pick as too difficult. Not one of the shell fragments took on the right hook shape to make the implement effective as a fork for removing the mollusk from its shell. That the native artisan did not always obtain the desired effect at the first trial was evident from the large number of improperly shaped conch-shell picks found in the vicinity of the cave hearths.

Another form of pick or, rather, ax was recovered at San Juan on the north coast of the peninsula. These implements were fashioned from the worked sections of manatee ribs (*Trichechus manatus*). Two of these are illustrated in Plate 12. No. 2, of Plate 12 (Cat. No. 341031, U.S.N.M), has been shaped by pecking to a sectional thickness of 1.7 centimeters (0.7 inch). It is 22 centimeters (8.8 inches) long and 5 centimeters (2 inches) wide. The outer or convex surface has been pecked with a stone celt from one end to the other, but the ends have been fractured through use. The broader end is 4.6 centimeters (1.8 inches) wide and is serviceable as a hoe or adze. The smaller end of the rib is rounded in section and made an excellent pick (diameter, 2.5 centimeters).

No. 1 of the same plate (pl. 12) has a hafting groove excavated at its center. The transversely placed groove is less distinct on the obverse or concave surface of the pick; elsewhere the groove is 0.8 centimeter deep and 1 centimeter wide. Hafting must have been after the fashion of the North American Eskimo hafted stone adzes—that is, the flat end of the wooden haft was placed against the ungrooved surface of the pick; withes were then drawn around the groove and then through a hole in the handle end. Dimensions: 26.5 centimeters (10.4 inches) long and 6.5 centimeters (2.6 inches) wide.

Amulets and zemis.—Decorative art in shell is best illustrated in the form of amulets or the so-called zemis. One of the zemis of carved shell (Cat. No. 341002, U.S.N.M.), was dug up from the midden at the San Juan site. It is carved in a zoomorphic form common to other sections of Haiti and Porto Rico as well. Some of the striking points of similarity in zemis of this form is that they

are fashioned without arms, while legs are represented as flexed under an erect body. Then, there is a marked triangular elevation in triangular form of the lower abdominal section. The head is devoid of representations of facial features, except for a prominent snout region and a high projection of the posterior skull section, probably representing a form of headdress. Minor differences, such as faint indications of facial features, eyes, ears, mouth, and so forth, exist as forms of local developments in art design. It is definitely established that certain forms of the same variety of zemi carving have been found in Cuba and on Turks Island. In other words, the form of shell zemi recovered at San Juan is typical of one form of amulet or zemi common to the island Arawak, of the Greater Antilles, as a whole. Whether this form of zemi was fashioned by different makers throughout the several islands named or whether its widely diffused appearance is indicative of native trade in religious objects, it remains that its use as a common form of spirit was common to the area as a whole. The zemi here referred to is illustrated in Plate 10 as 3. This conventionalized form was cut from a large section of conch shell. A transverse perforation for suspension had been drilled at the back of the neck section. Head and facial features are in one slightly concave surface, with one end serving as the projecting snout region and the other as an exaggerated crown or, possibly headdress. Arms are represented in embryo by incised grooves extending diagonally from the neck region to the center of torso at the sides. The erect body is unmarked except, as are all similarly carved zemis, namely, with a sharply defined triangular elevation of the lower abdominal section. Deeply incised grooves separate this abdominal proturberance from the legs, which are represented as flexed backward at the knees under the haunches but are terminated as a flat surface at base of figure. Feet are not indicated. This lack is balanced by corresponding absence of hands. A deeply incised groove separates the leg sections from one another and from the triangular abdominal projection or apron. The significance of this conventionalized form of zemi is not known.

There are several points of difference between the shell zemi figured as 3 of Plate 10 (also as 2 of pl. 11) and the bone zemi figured as 1 of Plate 11. The former is representative of conventionalized art in almost every respect and is protean in design; the latter is realistic and the product of a more mature shaping technic. The material of which the latter figurine has been shaped is a durable, fine-textured bone of undeterminel variety, yellowed from weathering, and is semifossilized. Two biconical perforations for suspension appear at the back of the head, when viewed from the front with the figurine in an upright position. In this position the features

are anthropomorphic, representing a human being with legs flexed sidewise at the knees. The arms are thrown upward behind the head. When viewed transversely, in a recumbent position, the figurine becomes zoomorphic and represents the figure of a frog (pl. 11, No. 2). In this position the flexed lower legs are in the characteristic froglike attitude of leaping; the upper legs also assume a typical froglike pose. Toes and fingers are indicated with three incised parallel lines. Two incised parallel lines traverse the entire length of each leg and arm and have the effect of vivifying the position of each member, tending to delineate the flexed musculature.

When viewed in the upright position the human facial features are represented by embossed surfaces, each well rounded and smoothed. Features are separated from other features by incised lines. Thus the eye is represented by a rounded embossed surface set diagonally and is distinguished from the raised eyebrow by a curved incised line or groove. From the large embossed triangle representing the nose the eye is set apart with a diagonal line traversing the length of the cheek. The pupil is a narrow diagonal slit at the center of the embossed eyeball. Upper lip and chin are low embossed surfaces set apart by a transversely incised line. Forehead is high. This, when viewed from the side, with the figure in a recumbent or horizontal position, becomes the projecting snout region of a frog. The large mouth of the frog is represented effectively by an incised line well rounded and extending well back. Between the extended back legs of the frog figurine is the raised triangular surface so noticeable in 2 of Plate 11. This triangular surface represents the throat and belly of the frog. The back of the frog figurine is a similarly embossed triangular surface which becomes the torso of the human or anthropomorphic figurine when viewed from the upright or vertical position (pl. 11, No. 1). This zemi is one of the few compound figurine carvings known to American aboriginal art. No similar specimen has ever been described from the West Indies, although the technic is Tainoan in its detail and can not be mistaken as from some other culture area. It is probable that the figurine was brought to Samaná from some of the more advanced centers of aboriginal art in Haiti or Porto Rico. It is impossible to identify the species of bone from which the figurine had been fashioned. The peculiar combination of a zoomorphic figurine when viewed horizontally and of an anthropomorphic figurine when viewed vertically in an upright position is a striking bit of evidence of native ingenuity in artistic design. It was recovered with the sievings at the rock-cleft mortuary on Upper Orange Key, about 5 kilometers west of the San Lorenzo Bay. It would be interesting to know of another

similar figurine carving from the West Indies. Others will no doubt come to light with future archeological research. Dimensions: Length, 5 centimeters (2 inches); width, 2.6 centimeters (1 inch) at the flexed knees; depth, 2 centimeters (0.8 inch) from eyebrow prominence to flexed knees. Illustrations of the figurine may be seen in Plate 11, Nos. 1 and 2.

The Taino Indians of Haiti, Cuba, and Porto Rico were in possession of many forms of totemic creations representing a wide range of agents which were recognized as powers for good or evil. Some of their highest expressions of art are fetishes designed to control the various crises in life as they knew it. The spirit of the hurricane, of the sun, moon, of ancestors, of sickness, death, birth, of the sky, the earth; in fact of any powerful natural or human agency must be invoked or appeased through the agency of the so-called zemi or personal totem. Dr. Walter Fewkes classifies the several forms of zemis as follows: "The name was apparently applied to the deities, idols, bones or skulls of the dead, or anything supposed to have magic power. The dead or the spirits of the dead were called by the same term. The designation applied both to the magic power of the sky, the earth, the sun, and the moon, as well as to the tutelary ancestors of clans. Zemis were represented symbolically by several objects, among which may be mentioned (1) stone or wooden images, (2) images of cotton and other fabrics inclosing bones, (3) prepared skulls, (4) masks, (5) frontal amulets, (6) pictures and decorations of the body."

A curious similarity of form in ancester worship with that of the Papuan of New Guinea may be noted in the Tainoan practice of severing the head of an ancestor and of preserving it in a basket. The New Guinea practice, as observed by Stirling, was to preserve only the lower jaw or mandible in an artistically fashioned woven bag which was carried suspended from the waist. Similar practices, no doubt, have been observed elsewhere, all bespeaking a form of reverence paid to some ancestor. Columbus found skulls stored in baskets placed in native huts both in Cuba and in Haiti. Las Casas writes that the huts where the preserved skulls were discovered were larger than the rest, and that the skulls were probably those of common ancestors. Pane tells us more definitely of the people of Santo Domingo that for zemis "some have their father, mother, kindred, and predecessors." In some cases the skulls or bones were made up in a cotton parcel which occasionally were given a human form. The zemis of this class were consulted through the medium of a priest and were believed to give advice on all subjects touching the welfare of their descendants.

The amuletic zemis seem to have been for the most part of stone, in the form of small anthropomorphic figures. These, both in

Cuba and in Santo Domingo, the native warriors bound to their foreheads when entering a fight.

Each cacique in Santo Domingo had a well-built hut situated a little distance from the rest of the settlement in which the various zemis were kept. There, too, was a well-carved wooden "table" made "like a dish," on which was the powdered tobacco which was laid on the head of the zemi and snuffed through a hollow cane shaped like a Y, the two upper branches being inserted in the nostrils.

A description of an important religious ceremony has come down to us which clearly was held in honor of the powers presiding over agriculture. For this the cacique would appoint a day, making the announcement by means of messengers. The people assembled in gala dress, the men painted red, black, and yellow, and decorated with the feathers of parrots and other birds of bright plumage. The women were not painted; those who were married wore a loin cloth, but the unmarried were nude. All had their arms and legs, from the knee down, covered with shell ornaments which rattled as they moved. The cacique entered the zemi hut where the priests were decking the idol and sat down at the door, playing on a wooden gong. The populace advanced, the men first, dancing and singing, and, after thrusting sticks down their throats in order to produce vomiting (by which they were supposed to attain a condition of ceremonial purity), they sat down before the zemi and began a ceremonial chant. Then certain other women entered, bearing baskets of bread ornamented with garlands, and went round the singers, repeating a little chant. This was answered by the audience, which afterwards began a song in honor of the cacique and his ancestors. During this performance the bread was offered to the idol and then distributed by the priests among those present, who took it home and carefully preserved it until the next year as a powerful amulet against fire and hurricanes. The ceremonial use of bread here referred to as a native Haitian practice has, of course, no connection with the somewhat similar Christian observance of the Lord's Supper.

Clothing and weaving.—The Arawak Indians of the Antillean Archipelago possessed but scanty clothing, although skillful weavers of cotton cloth. Women wore a short skirt of woven cotton fabric after marriage, but unmarried girls went naked. In the culturally more advanced districts of aboriginal Haiti there was a distinction between women's skirts according to the rank of the wearer, the typical garments of this description reaching from the waist to mid-thigh, while the skirts of women of importance extended to the ankle. Among the Lucayans of the Bahamas and the natives of Porto Rico, Haiti, and Cuba the male population went entirely nude. Body painting was resorted to in the absence of clothing.

Puberty of girls was celebrated by a feast, after which the girl wore a small net filled with leaves and attached to the waist. Both sexes wore ornamental bandages on upper arms, below the knees, and at the ankle. The legs of women were swathed with cotton bandages from ankle to the knee. Similar ornaments were worn in Jamaica and are still worn by the Indians of southeastern Panama.

Ferdinand Columbus, writing of the Carib of the island of Guadeloupe, refers to the same custom as being practiced in the Lesser Antilles. He writes that "the same both men and women use in Jamaica, who swath their arms up to their armpits, that is about the smallest parts, like the old-fashioned sleeves used among us." Presence of similar cotton bandages is indicated on a wooden zemi carving in the National Museum from Haiti.

That the Ciguayan Indians of Samaná were also weavers is indicated by a discoidal spindle whorl of burned clay (Cat. No. 341023, U.S.N.M.), which was recovered from the Ciguayan village site at San Juan (pl. 17, No. 6). The presence of netting tools and of net weights, together with other objects, offer evidence of the extensive use of woven cotton yarns by the former Indian population of that area. Ferdinand Columbus tells that in Cuba a large quantity of cotton, estimated at 12,000 pounds, was seen and, no doubt, appropriated by the Spanish. A different form of the loom, unlike the South American Arawak type, was also seen in Cuba. It is possible that this loom resembled more that of the Mexicans or Central Americans, and, if so, is an interesting evidence of Central American influence in the West Indies. The spindle whorl uncovered by the Museum expedition was of pottery, although stone whorls have been found in the Greater Antilles. The finding of pottery stamps at San Juan (pl. 17, Nos. 1, 2, 3, 4, 5) may indicate that stamped decorative patterns were also applied to woven cloth by the island Arawak of Haiti. Stamps of pottery from Haiti, including those recovered by the Museum expedition from San Juan are more crude than the Mexican stamps, but in a general way resemble the Mexican form. Quite an array of Mexican resemblances might be listed in this connection, all of which, however, such as stamps, clay figurine heads, metates, stone stools, tubular beads, loom, and other objects, are generalized in their resemblance and can not be directly associated with any one Mexican culture period or area. Cylindrical stamps of wood are used by certain tribes of the Amazon Valley in decorating their textiles with designs. It is possible that the Samanán pottery stamps are, after all, more adapted to similar purposes, also to placing ornamental painted designs on the body, than to apply relief decorative designs on pottery vessels. No pottery vessels with incised or embossed designs made by pottery stamps were found in Samaná.

The hammocks used by the natives of Haiti were of woven cotton cloth, both as to warp and woof, rather than of looped openwork netting. They constitute the one striking example of textile development widely used among a people who wore little clothing and possessed but little cloth, although possessing the South American weaving technic as brought to the West Indies by the island Arawak.

Basketry.—We know very little of the basketwork of the Tainoan or the Ciguayan Indians of Samaná. It must have been of good quality and have been used for a variety of purposes. The handling and storing of food such as cassava entails the use of a variety of basketry forms. This we know from contemporary studies of modern South American tribes. Baskets used as water carriers have been reported from Haiti. These baskets must have been carefully woven. The pattern was double, one layer of woven grommets of *Heliconia* stems being placed within another and the intervening space filled in with leaves as a seizing. Double basketry weaves are also known from northeastern South America.

Strings and cordage for nets and other purposes were obtained from the leaves of a plant which was soaked for several days in water. The leaves (henequin) were then stretched and dried in the sun, beaten with a flail, and the fiber retted. The fiber was then twisted and beaten again to make it more pliant. In the West Indies basketry was woven of flat splints, not sewn or coiled. West Indian baskets were plaited in openwork weaves (hexagonal weave), as also in more compact forms of simple weaving, as from the southeastern United States. Matting was fashioned by tying canes together.

A peculiar form of decorative design in crosshatching, apparently formed by the imprint of a basketry fabric on earthenware, is illustrated in 6 and 7, in Plate 18. The design must have been formed by pressure of the basketry fabric against the soft earthenware paste before firing. The impression of the basketry fabric appears only above the shoulder of the vessel and extends upward to the incurved rim. There is a slight resemblance to the check stamp pottery designs from the Gulf States, but the resemblance is only apparent because of the reticulated effect of the basketry imprint. The use of a form of basket as a receptacle for ancestral skull zemis has previvously been referred to. The form of twilled or herringbone weave in two or more colors was also common to the West Indies.

Objects of wood.—The few specimens of wood carving which have survived reveal with what facility the Tainoan carver handled his material. The surfaces of the better preserved specimens of carvings on hardwoods are covered with decorative patterns in incised lines and curves. Many figurine carvings in wood and the few decorated seats from the island of Haiti preserved in museums are superior in their craftsmanship to modelings in clay.

A wooden zemi or amulet from the Samaná Bay region is illustrated as 3 of Plate 11 (Cat. No. 340044, U.S.N.M.). This small carved figurine is remarkably well preserved, although it had been exposed to the deteriorating influences of centuries. It was found at Anadel embedded in the durable dry, loamy clay near the bank of the stream at a depth of 4 feet from the present top of the midden. Unfortunately, the lower part of the left arm had been broken off. The base, including the lower portion of the legs, is also missing. It is therefore impossible to determine whether the conventional form of flexing the lower limbs in zemis of shell and stone had been followed by the aboriginal artist. The figurine, in so far as it has been recovered intact, is entirely different from the shell figurines recovered by the Museum expedition from the San Juan and Upper Orange Key sites. The carving had been deeply incised in shaping parts of the figure and in portraying facial features, as eyes and mouth. It resembles more the large wooden zemi from Puerto Plata figured by Dr. J. W. Fewkes [21]. A headdress is represented by a transversely encircling incised groove at the crown. Within the encircling groove are five short parallel incised lines extending from the front to the back of the head. Sinuous incised grooves and embossed surfaces at the back seem to indicate long flowing hair. A raised surface carefully embossed by cutting away the adjoining surfaces extends down the sides. This also may represent long, flowing hair. In the two deep-set pits representing eye sockets and the deep-set plane of the mouth with thick raised upper lip one again sees typical Tainoan technic in delineating the human figure. The embossed ridges representing eye orbits and the upper and lower lips resemble the luted on strips of clay representing corresponding features in clay figurines. For each raised surface appears a corresponding pit or central excavated surface. The recovered section of this wooden figurine (Cat. No. 341044, U.S.N.M.) is 2.7 centimeters (1.1 inches) long, 1.3 centimeters (0.5 inch) wide, and 0.7 centimeter thick. It appears in slightly enlarged form in the illustration (pl. 11, No. 3). As the entire section of the portion of the figure recovered is slightly curved, with the concavity at the back, and as the basal portion is missing, it is possible that the figure is the decorated end of an unusually small swallowing stick and not a zemi figurine in the usual sense.

Objects of stone and metal.—Ciguayan Indians of Samaná did not use stone architecturally. There are, therefore, few fixed works other than shell heaps and large kitchen middens near the sites of former villages. The crumbling walls of a rectangular earthenware structure in the hills a few kilometers back of Samaná Bay may possibly represent the remains of a Ciguayan structure—possibly a

[21] Thirty-fourth Annual Rept., Bur. Amer. Ethn., pl. 90.

ball court or a zemi house. Schomburgk describes earthworks from several sites in Santo Domingo other than Samaná.

The carving of minor objects of stone devoted to ceremonial use surpass in elaboration of design corresponding Mexican forms which are entirely lacking in South American Arawakan art. The stone collars, 3-pointed stones, and stone masks are the most interesting forms of Tainoan art in stone sculptures. A small example of a 3-pointed stone (Cat. No. 341049, U.S.N.M.), was recovered by the Museum expedition from San Juan, but no other examples of these forms were found in Ciguayan territory. A large stone collar of the massive type has recently been found near Macoris, in southeastern Santo Domingo. Stone collars are oval in shape, while Mexican analogues are mostly open and at the same time display unrelated phases of symbolic art. Haitian forms are skillfully fashioned and incorporate in their larger examples decorative panels of anthropomorphic figurines which appear as rim decorations and handle lugs of Ciguayan earthenware vessels (pl. 19, Nos. 1 and 2).

Zemis, or personal totems, are carved from stone in the form of anthropomorphic figurines, are more rare from Samaná than from other Provinces of aboriginal Haiti, although the worked standstone 3-pointed figure from San Juan is a typical example. Zemis of shell from Samaná sites are of small dimensions and have perforations at the back for suspension. This arrangement shows their former use as pendants and not as frontal amulets. Large columnar stone carvings etched on the rounded upper surfaces of stalagmites in the caves are more numerous but are less well made.

Columnar stone zemi carvings are uniformly inferior to the petroglyphs and etched inscriptions on the walls of caves in the San Lorenzo Bay island keys. Rounded and smooth surfaces of the limestone walls of the caves of this region have been artistically carved by some unknown native stoneworker. These petroglyphs in some instances have unusual artistic merit, but usually are quite crudely executed anthropomorphic figures. It is safe to affirm that such anthropomorphic carvings are to be considered as zemis, although many of the stone carvings found on the cave walls represent birds, fish, or mammals, and depict hunting or fishing scenes of no particular significance. The realism with which such animal figures are either painted or carved gives to them a certain significance as an index to the natural history of Samaná in pre-Columbian times and is in striking contrast with the more formal and conventional designs appearing on native pottery.

The more utilitarian objects shaped from stone are less skillfully fashioned. Decorative pestle heads of stone are not characteristic of the area, while undecorated stone pestles were recovered by the expedition in considerable numbers, as were also undecorated triturating

stones. The stone celt of the almond or so-called petaloid variety occurs in great abundance in Ciguayan shell heaps. Such celts are uniformly and symmetrically ground and polished over the entire surface. A similar type of polished stone celt appears in the southeastern United States. Monolithic stone axes are of rare occurrence in Porto Rico and Haiti, and none were recovered by the Museum expedition. They represent a translation into stone of a form of hafting employed by the Taino in mounting their polished petaloid stone celts with wooden handle hafts. That the typical Tainoan stone celt was so hafted is evidenced by the recovery of one or two examples of celt blades still retaining fragments of the wooden handle. The tapered body of the stone celt had been inserted through an opening cut through the bulbous basal end of a wooden handle. Grooving for attachment of a haft occurs more rarely in Santo Domingo. A few specimens illustrating this form of hafting were recovered by the Museum expedition from the sites at Anadel and San Juan. The European method of drilling a hole through the stone celt or ax for the insertion of a wooden haft is foreign to the Antillean stoneworker's technic and exists nowhere in the New World. The grooved ax of the North American mainland is also foreign to the island culture of the West Indian Archipelago; neither is the grooved and artistically shaped and ground ax of the Carib to be found anywhere along the Samaná coast.

Chipped implements are of rare occurrence. As in the northwestern parts of North America, grinding and crumbling take the place of chipping as a shaping technic. Absence of suitable varieties of stone, the use of bone projectile points, and the presence of durable, easily shaped woods as weapon and projectile points account in part for the almost entire lack of the art of stone chipping in the Greater Antilles.

Uses of gold and of metal alloys.—Metal was scarce in the Antilles. Gold used by the natives was worked by them into thin plates and then shaped into objects of personal adornment and into amulets. Hammering of gold between two stones was developed by the Taino after they had arrived in the Greater Antilles, as there is no gold in the Lesser Antilles except what has been introduced through the agency of primitive barter. Arawak and Carib were unacquainted with tools of metal, although an alloy of gold and copper "guanin" or "pale gold" had been worked into lance heads. Gold appears to have been collected primarily for use in ceremonial objects and to have been obtained principally in Haiti, whence it was carried in trade to most of the islands of the West Indies. The Lucayans informed Columbus that gold came to them from the south; Cubans said that it came to them from the east; while the Ciguayans of Samaná Bay pointed to the eastward, to the island of

Porto Rico, and claimed that "guanin" (pale gold) came to them from the island of Carib (Porto Rico). Ornaments of gold plates were worn in the ears and nose, also suspended about the neck. The cacique Goacanagaric appeared before Columbus wearing a headdress resembling a crown and shaped from gold plate. This he placed on the head of Columbus as a gift. Las Casas is authority for the statement that Goacanagaric presented a girdle to Columbus which he describes as a "belt, which in place of a pouch, was furnished with a mask, with two great ears of hammered gold, nose and tongue also. This belt was of very minute jewel-work, like baroque pearls, made of fishbones, white in color, intermingled with a few red. It was sewn with cotton thread in the manner of embroidery, with such skill that the threadwork on the reverse side resembled fine needlework, though all in white, very pretty to look at, as if it had been woven on a frame, like chasuble-borders in Castile. And it was so stout and strong that I believe it could not be pierced, or only with difficulty, by an arquebus." It was 4 inches broad. Another Spanish writer mentions woven belts as incorporating thin plates of gold interwoven in the cotton fabric with wonderful skill. Caribs adorned themselves with crescent-shaped plates of gold suspended from the ears and on the breast. When the Ciguayan Indians of Samaná said that "pale gold" and "tuob" (gold without alloy) came to them from the east they probably told the truth, as the term generally applied to gold elsewhere on the island of Haiti was "caona"—a term they did not understand when used by Columbus's guides from the Lucayan Islands.

Gold mining on the island was primitive, indeed. A hole was dug in the sand, the nuggets extracted and placed in containers of calabash. Washing in wooden pans was also practiced. Nuggets were then beaten into thin plates with stone hammers. Some of the masks fashioned by hand from thin plates of gold were set in cement.

A spatula-shape object of copper alloy was recovered from the midden at Anadel. It is impossible to determine what the uses were to which the metal spatula was put. It is 10 centimeters (3.9 inches) long and tapers from the base to a sharp point. The basal section is flattened by hammering into a semilunar disk, while the object is elsewhere rectangular in section. Several similar metal spatulas from Ecuador are in the archeological collection of the United States National Museum. (Cat. No. 341054, U.S.N.M.)

Natives of Samaná at the time of the discovery relied on implements of stone in the manufacture of their implements. No doubt most implements of teeth, bone, and other more perishable materials have vanished long ago. Implements of shell appear to have been

used extensively where no suitable stone could be obtained. The surfaces of stone implements were generally finished by grinding, flaked implements being of rare occurrence. A few flaked implements and cores were recovered from the sites worked by the museum expedition in Samaná. It is probable that implements of this description were adopted to a variety of uses, although the existence of a series of implement forms in shell appears to delimit such flaked and rechipped stone forms, as were recovered, to a variety of improvised uses.

Ground and polished stone celts.—The polished and ground stone celt is the most characteristic of all Tainoan implements of stone. A series of these was recovered from the open village sites on the peninsula, some rectangular in section, some broad and flattish in mid section, others with straight sides. All are single-bitted and reveal a ground and polished surface. Two additional characteristics of the Tainoan polished stone celt or ax blade have been noted for which the finds in Samaná deposits show exceptions. These are absence of any groove for hafting and a tapered and rounded butt. The usual type from the Samaná sites revealed a high polish, a rounded and tapered butt, and no groove for hafting; but at Anadel were recovered several specimens rectangular in section, unpolished, and having flat, rectangular butts. The straight cutting edge of some of the Samaná celts is another departure from the typical Tainoan celt form. An interesting observation is the large number of broken and fragmentary celts from the midden at San Juan showing secondary use as unhafted hammerstones.

A few celt or ax blades have been recovered from various sites in the Greater Antilles on one side of which an anthropomorphic image had been rudely carved. This is merely another illustration of the wealth of media utilized by a people whose culture has once taken up the technic of portrayal of life forms, particularly of the human figure. The practical use to which stone celts or axes were subjected precluded the exuberant use of the sculptor's arts on such media. Oviedo's description of the hafting process clearly illustrates why paneled relief carvings on stone celts must be unusual. The wooden handle haft, according to Oviedo, was first cut to the required length and split from the bulbous end. The thin stone blade was then inserted in the cleft and a tight sewing of rattan splints placed around the haft on either side to hold the blade securely in position. This also prevented the split from advancing. The hafting of a celt in a hole cut from a thick handle end is to be seen in a specimen preserved in the United States National Museum from Turks Island.

The petaloid stone celt of the Taino has been many times adequately described. It, along with the distinctive forms of decorated pottery, cassava griddles, stone pestles with ornamental figurine

heads, archaic clay figurines, and so-called pottery "stamps," is characteristic of the culture of the Taino and of the island Arawak.

Harrington has described the multiple-faceted polishing stone found by him in Cuba as used in polishing and in grinding down the stone from which the petaloid stone celts were fashioned. Now, a similar object was recovered by the Museum expedition from the bottom of the cultural deposits within the "Railroad" cave at a level from which no other Tainoan objects were recovered. On the contrary, many objects of shell, of distinctly pre-Tainoan origin, were found, along with flint flakes and flaked stone implements. No stone celts of any description were recovered from any of the caves of the Playa Honda coast. Shell implements of diverse description, including shell gouges of the Barbadoes shoehorn variety, which are of frequent occurrence in Floridan shell heaps, were found.

The presence in the caves of a celt polisher is therefore decidedly anomalous, especially so as it comes from near the bottom of the shell deposits from a culture layer of undoubtedly undisturbed material. This implement is now in the National Museum of the Dominican Republic at San Domingo City.

In Plate 5 are illustrated several varieties of stone celts. The common highly polished type of petaloid greenstone celt forms No. 2 of the series (Cat. No. 341014, U.S.N.M.). Dimensions: 9 centimeters (3.6 inches) long, 4 centimeters (1.6 inches) wide, and 2.1 centimeters (0.8 inch) thick. It is noteworthy that stone celts of this variety apparently always have perfect cutting edges when recovered. Two celts of this type now in the National Museum are still incased in a wooden handle haft. The smaller or rounded end was inserted into a slot gouged or burned out of a bole of lignum-vitae. The celt was frequently not hafted but was used like the Carib axes as a hammerstone.

While the object figured as 2 of Plate 5 is uniformly polished throughout, 1 of the same plate is highly polished on its lower section but is rough textured on the upper half. It is apparent that the upper and smaller end had been inserted as a tang into a wooden haft and had therefore not been polished. The material, a greenish soapstone, is similar to that of 1. Dimensions: 8.7 centimeters (3.4 inches) long, 4.5 centimeters (1.8 inches) wide, 2.5 centimeters (1 inch) thick. (Cat. No. 341014, U.S.N.M.)

In each of the celts just described the bevel from center to either end is uniform and continuous and the body of the celt is oval in section. No. 3 of Plate 5 shows flat and irregular lateral walls. A polished surface has been effected through rubbing on a polishing block of sandstone, but deep gougings on the surface remain unworked. Then, too, the bevel at the cutting edge is abrupt and is

not continuous with the flat lateral surfaces or with the slope of the edges. The celt has a roughly triangular outline. It, together with other celts shown in Plate 5, was uncovered at the San Juan site. Dimensions: 8 centimeters (3.2 inches) long and 4.2 centimeters (1.6 inches) wide. Greatest width is at the cutting edge instead of at the center, as with 1 and 2. (Cat. No. 341014, U.S.N.M.)

Celts 4 and 5 (Pl. 5) represent a well-established Arawak type; they are more rounded and slender in section, have a larger head, but are uniformly beveled on a slope beginning at the center of the celt, as with 1 and 2. This type is frequently found in deposits along with the petaloid stone celt and tends to confirm the San Juan site as partly Arawakan in type, an observation confirmed by other kinds of artifacts to be described. Dimensions of 4: 10 centimeters (4 inches) long and 2 centimeters (0.8 inch) in diameter. (Cat. No. 341016, U.S.N.M.)

Hammerstones.—Improvised tools meeting the requirements of a variety of uses were flaked from a form of schistose rock. Some were apparently used primarily as fish-scaling knives and were held in the hand. There is no evidence of hafting. These primitive undifferentiated tools were particularly plentiful in the cave deposits and at Anadel. One of these implements which may be selected as a type is Cat. No. 341052, U.S.N.M. Dimensions: 6.9 centimeters (2.7 inches) long, 5 centimeters (2 inches) wide, and 1.5 centimeters (0.6 inch) thick.

Two stone hammers partially grooved at the center for hafting are illustrated as 4 and 5 of Plate 1. These stone hammers are much abraded at either end through use. In 5 the end fractures are so placed as to form an effective cutting edge. These and similar stone implements are general utility forms and may even have been used as net weights. Dimensions of 4: Length, 6.4 centimeters (2.5 inches); width, 5 centimeters (2 inches); thickness, 2.6 centimeters (1 inch). Dimensions of 5: Length, 9 centimeters (3.6 inches); width, 6.4 centimeters (2.5 inches); thickness, 2.6 centimeters (1 inch). (Cat. No. 341052, U.S.N.M.)

A large flat-surfaced stone flake, probably used as a crude knife and hand hammer is figured as 6 of Plate 1. Uniformly fractured facets extend entirely around the circumference. They have been struck off from either side as to give a blunt cutting edge all around. No grooves for hafting nor pits excavated at the sides are in evidence. Dimensions: Diameter, 12.5 centimeters (4.9 inches); thickness, 2 centimeters (0.8 inch). (Cat. No. 341048, U.S.N.M.)

No. 3 of Plate 1 is a thickish stone flake (1.3 centimeters (0.5 inch) in section). One of the edges shows much abrasion through use, apparently as a hammerstone. The lower section has been pol-

ished, showing that polished stone celts sometimes underwent secondary use, probably after being broken accidentally. Dimensions: Length, 7.3 centimeters (2.9 inches). (Cat. No. 341053, U.S.N.M.)

Notched and grooved stone implements.—Several stone celts from Anadel and San Juan have been notched at the sides. The excavations were made with considerable care by pecking and not by simple fracturing of the durable greenstone. Lateral surfaces of these celts are flat and are smoothly polished, while the edges are rounded. As this form of notched stone celt was recovered from the San Juan site where other possibly Carib artifacts were also recovered, it is not unlikely that the notched celt substantiates the claim repeatedly made that the culture of the Samanán north coast incorporates several elements entirely distinct from the characteristically Tainoan.

Another anomalous form of stone celt or ax from San Juan has a slight bulbous elevation encircling the body of the implement at the center. The implement has been shaped from igneous rock and shows abundant evidence of use. Ends are abraded through use, the basal end apparently having been intentionally bilaterally fractured for use as an ax. The sides and rounded lateral edges have been pecked into some semblance of an oval cross section. This is especially noticeable in the concavities encircling the implement just above and immediately below the raised and unworked central band. The embossed surface at the center may have been intended as a handgrip, and in all probability the implement is a form of hand ax or celt characteristic of Samaná, but new to science from the area.

A rectangular celtlike implement of limestone from San Juan is broken off, only the smaller end section remaining. In this rectangular section of worked limestone we again have a novel type of implement. Rectangular stone celts heretofore were unknown from Samaná, as were also the forms of hand axes here described, likewise the conical stone pestles with undecorated head.

Most interesting types of stone implements from Samaná are those bearing slight evidences of chipping. This is in part due to their rare occurrence in the West Indies, also because of their crudeness. The abundance of pottery remains in Samaná is as striking as is the rarity of stone chipping as a shaping process. Most noteworthy among the flaked stone implements from Samaná are the scrapers, knives, and the crudely notched or pitted hammers and anvil stones. No rechipped edges appear within this group of stone objects. Stone tools showing rechipping were entirely absent from the Ciguayan village sites on the peninsula, but incipient chipping of stone implements was noted in the objects of stone recovered from the shell deposits in the caves from the south shore of Samaná Bay. Rechipped edges of stone knives and of stone scrapers collected by M. R. Har-

rington from "Ciboney" sites in Pinar del Rio Province in Cuba are much more finished in appearance. Entirely rechipped edges come from the "Ciboney" sites, while the Samaná specimens show more crude flaking, with but little evidence of rechipping. Sharp points and cutting edges were fashioned by striking off large axial flakes with a few well-directed blows from a hammerstone. Stone cores with transversely chipped facets were recovered from the cave deposits of Samaná. Some of these revealed a slight development of the art of stone chipping, but no tools or implements shaped entirely through the process of chipping were recovered by the Museum expedition. From some of the descriptions given it will be noted that both as to chipping and as to notching and grooving, the stone-shaping technic of the aborigines of Samaná was in its incipent stages.

Stone implements figured in Plate 3 are typical of the flaked implements found in some quantity embedded in shell heaps in caves in the San Lorenzo Bay region of Samaná Bay. Here were accompanying artifacts such as shell gouges of the shoehorn type, plates and ladles of shell, caches of round pebbles near the hearth or fireplace, like those found by de Booy near Macoris, together with a few isolated undecorated potsherds. Number 1 of Plate 3 is a combination tool formed by fracturing, plain on one side and showing a median ridge with several facets on the other. The implement is a combination knife and perforating tool and was doubtlessly used in several ways by the aboriginal cave dwellers as a tool for opening shells, as a pick, and as a knife. There is no chipping at the edges, which are sharp. For No. 1 dimensions are: 11.5 centimeters (4.5 inches) long, 3.2 centimeters (1.3 inches) wide, and 0.7 centimeter (0.3 inch) thick. (Cat. No. 341057, U.S.N.M.) No. 3, Plate 3, has no perforating point, but has been fractured into the form of a knife. This flaked implement has median ridges on either lateral side, and has bilateral edges of knifelike sharpness. It is a type of flaked knife found elsewhere in the New World and used in the manner of aboriginal folk practically the world over. Dimensions: 9.7 centimeters (3.8 inches) long, 2.6 centimeters (1 inch) wide, and 1 centimeter (0.4 inch) thick. (Cat. No. 341053, U.S.N.M.) No. 2, 4, 5, and 6 of Plate 3 are more irregularly flaked flint implements. Either lateral side shows many facets and the median ridge is irregular or entirely missing. Larger bowlders from which these knives were struck off are never found near or in the caves (*in situ*), the rock formation there being of limestone. It is obvious that these simple stone tools were shaped by the only process known to the cave population, short of polishing. It was not their custom to polish knives or to manufacture stone celts. Their only recourse was to the process of fracturing for such extemporized implements.

Perforators and drills.—Objects recovered from Samaná Province showing perforations for suspension are represented by tubular stone beads and by small zemis of stone and shell. The incised punctations and perforations on pottery were made with a blunt or pointed implement, probably a sliver of wood, such as was used in making other incised decorative lines. Many of the objects of flaked stone recovered are of general or unspecialized use and may be described as perforators, picks, or knives.

An unusual form of stone tool is illustrated as 8, Plate 1, Cat. No. 341018, U.S.N.M. There are many uses to which an aboriginal population might put such a massive perforating point and cutting edge as the one shown in the illustration. The stone is a fine-grained variety of schist; it was shaped by striking off a few large flakes from a core consisting of a large pebble of roughly rectangular shape. Two large facets converge at the center of one end to a sharply defined point. Identical forms of stone tools, often obviously improvised but always revealing the centrally projecting point, occur among the refuse heaps and workshops throughout aboriginal America. Many were collected by the writer from village sites and burials along the Columbia River in the State of Washington. Dimensions: Length, 13 centimeters (5.1 inches); width, 11.5 centimeters (4.6 inches); thickness, 4 centimeters (1.6 inches).

A large perforator of stone (Cat. No. 341012, U.S.N.M.), still showing the marks of the saw with which it was formed, was uncovered at the San Juan site. The object is illustrated in Plate 9, No. 2. It is 6.8 centimeters (2.6 inches) long and 1.5 centimeters (0.6 inch wide). There are bilateral ridges left by the incomplete sawing extending the entire length. This unintentional pilastering gives the tool a thickness of more than 1 centimeter. The saw employed in cutting this tool from the stone core must have been of sandstone. As just stated, the axial sawing is incomplete, and when the tool was nearly severed it was broken from the core with one blow. This method of incomplete sawing is practiced by the Eskimo and Indian tribes of the North Pacific coast and used by them in shaping their jadeite and greenstone celts. The object just described is cut from calcite, a durable stone of whitish color. The point shows much evidence of use and is irregularly fractured.

Knives and scrapers.—Practically the only forms of flaked and chipped stone implements recovered from Samaná Province were excavated from the cave floor in the deposits in the San Lorenzo Bay region. It has been said that stone implements such as are figured in Plate 3 are undeniably pre-Arawak. These and many other stone implements of similar description were excavated from the shell deposits in the caves in the San Lorenzo Bay region, but none were recovered from the village sites at San Juan and from Anadel.

Harrington found several implements similar to 1, 3, 4, and 5 of Plate 3 in what were described by him as pre-Tainoan sites in Cuba. The circumstances surrounding the deposition of the flint implements here shown are such as to intimate the existence of a preagricultural or pre-Tainoan culture in Santo Domingo and on the entire island of Haiti as well.

No. 6 of Plate 3 is of a green-textured soapstone, a very hard variety of stone which does not occur on the south shore of the bay. Similar types were uncovered at San Juan. The object is a combination tool, serving as a hand scraper, perforator, and saw. One of the lateral surfaces is the natural smooth surface of the bowlder from which the implement was struck off. The other lateral surface has several facets. Edges show no rechipping. Dimensions: 9 centimeters (3.5 inches) long, 4 centimeters (1.6 inches) wide, and 1.2 centimeters (0.4 inch) thick. (Cat. No. 341018, U.S.N.M.)

Three of the more common forms of stone implements from Samaná are figured in Plate 1. No. 1 of this series (Cat. No. 341057, U.S.N.M.) is from Boca del Infierno cave of the Playa Honda coast. It is a granitic form scraper knife, having one smooth lateral surface, the other being formed by fracturing. The working edge at one end of the object is a single facet and shows slight evidence of use. The implement is one of those primitive undifferentiated cutting devices belonging at the very beginning of the stone-shaping technic. It is 7.5 centimeters (2.9 inches) in length. Cutting edge is 4 centimeters (1.6 inches) in extent.

A schistose, flaked scraper knife, 2, of Plate 1, was recovered from the deposits at San Juan. It resembles the flaked knife 1, Plate 1, in that the terminal fracture is concave. The entire circumference has been shaped as a cutting edge and shows evidence of use as a knife, but has been dulled by use. Dimensions: 7.3 centimeters (2.9 inches) long, 4.7 centimeters (1.8 inches wide, and 0.8 centimeter thick. (Cat. No. 341018, U.S.N.M.)

Polishing stones.—A polishing or smoothing stone (Cat. No. 341058, U.S.N.M.) was found in the deposits on the cave floor of the San Gabriel cave. It is typical of many similar stones collected from the middens of the caves of the Playa Honda coast as well as from village sites on the peninsula. Just what the purpose of the stones might be when used in the caves is impossible to determine. If pottery had been made at the caves, the presence there of smoothing or of polishing stones might readily be explained. Again, if polished stone celts were found in the caves, the presence of various other forms of polish stone might be interpreted as indicative of the presence of the Ciguayan Indians. From the entire lack of pottery shards in some of the caves and the limited quantity in other cave

deposits, as in the San Gabriel cave, it must be inferred that the type of polished stone under discussion probably had other uses, possibly amuletic, or as a zemi. The stone is smooth as to surface, almost leaf-shaped in outline, with well-rounded base and tapered ends and lateral edges. Dimensions: 6.5 centimeters (2.5 inches) long and 3.5 centimeters (1.4 inches) wide.

Sandstone abrading tools were picked up from the several sites explored, but the larger number came from the San Juan site on the peninsula. Surfaces show no working but much abrasion through use. A many-faceted sandstone polisher was found near the bottom of the deposits in the "Railroad" cave. This stone has previously been referred to as a celt polisher, but could scarcely have had such use at a site where celts had not been used. The object was shaped in symmetrical design, having two facet planes tapering toward the two flattened ends. The artifact is now in the National Museum of the Dominican Republic.

Pestles.—No decorated stone pestles were recovered at any of the sites visited, either on the north shore of the bay or at the caves of the Playa Honda coast. Three stone pestles or grinding stones, plain in outline and undecorated as to surface, but carefully worked and symmetrically shaped as to form three distinct types, are illustrated in Plate 5 as 6, 7, and 8. The Museum expedition was successful in recovering the bulbous working end of an earthenware pestle; also, a perfect specimen of a small pestle of carved shell (pl. 9, No. 5).

Stone pestles are found throughout the West Indies. Those of the Lesser Antilles are mostly plain undecorated conical forms like those recovered from Samaná, while those from the Greater Antilles are ornamented with an anthropomorphic or bird figurine carving at the head. No 6 of Plate 5 is somewhat irregular as to form, but resembles a segment of a truncated cone. Both head and lens show evidence of hard use, the head probably as a hammerstone. It is smoke-blackened and has been shaped from an igneous rock. A smaller pestle was picked up at the entrance of a small cave 5 kilometers east of Samaná on the north shore of the Bay. This small pestle (No. 7, pl. 5) is also conical in outline, but is more truncated, being oval in section and triangular in profile. It appears foreshortened in the illustration, the view being from the top looking down on the rounded head. The stone pestle illustrated as 6 is 13.4 centimeters (5.3 inches) long and 7.5 centimeters (2.9 inches) in diameter, while pestle 7 is of a similar diameter but shorter, namely, 7.4 centimeters (2.9 inches) in length. In outline this stone pestle is roughly oval, being straight-sided one-half the distance from the bottom, but tapered from the center to the rounded head. (Cat.

No. 341063, U.S.N.M.) The pestle resembles one recovered by De Booy from a shell heap on the Cristobal Colon estate on the Higuamo River 3 miles above San Pedro de Macoris. Here also were located a cache of seven pestle stones, square in section, like those recovered by the Museum expedition from the San Juan site.

Another stone illustrated as 8 in Plate 5, had been used as a grinding and hammerstone. It is rounded at the base, oval at the top, and having rectangular section with rounded edges. This implement, like 6 and 7, had been smoothly shaped by pecking, but is unpolished. No. 8 is 5 centimeters (2 inches) long. (Cat. No. 341068, U.S.N.M.) Both this implement and the conical or pear-shaped pestle or grinding stone (7 of pl. 5) are not Arawak types. Characteristic Tainoan stone pestles have decorative zoomorphic figurine heads. It is therefore probable that the conical pestle forms without decorative heads represent or typify a more primitive culture than that of the Taino of Haiti and belong to the characteristically cruder Ciguayan culture complex as frequently manifested in Samanán finds.

Uses of coral.—The deposits of finer sediments are mostly in the western end of Samaná Bay near the distributaries of the Rio Yuna. Except for such deposits, the water of Samaná Bay is mostly clean and affords suitable conditions for the growth of corals. Off the mouth of the harbor at Samaná colonies of the staghorn coral (*Acropora muricata*) and of palmate coral (*Acropora palmata*) are growing. There are several other coral reefs in different parts of Samaná Bay similar to coral formations elsewhere in the Antilles.

A piece of worked coral 7.3 centimeters (2.8 inches) long, and 3.3 centimeters (1.3 inches) in diameter at the base, but tapered to a blunt point, is figured as 1 in Plate 9. This implement of coral has been shaped into the form of a pick with a pointed end and a hole for hafting excavated nearly through the coral block near the larger or basal end. The perforation is 1.5 centimeters (0.6 inch) in diameter and is of equal depth. Whether this implement is a drill handle or a pickax is problematical. If a pick, as intimated, the object is a rare one, as similar hafting perforations have never before been reported from the Antilles. The grooved ax is the typical New World cutting implement, but even grooved implements are rare from Taino and Ciguayan territory. In Europe several forms of axes and gouges or celts have hafting holes excavated from basal or midsections. The implement just described, if a pickax, introduces a new form of haft into the Antilles which is similar to that of the Old World. (Cat. No. 341013, U.S.N.M.)

Coral perforators symmetrically shaped by crumbling into truncated cylindrical forms 2 to 3 inches in length were recovered from

Anadel. Hollowed, crescent-shaped gouges shaped from coral were also recovered from the site at Anadel. Implements of coral were lacking at the San Juan site and were scarce in the cave deposits on the south shore of Samaná Bay.

Stone beads.—One of the few articles of personal adornment recovered from the shell heaps and cave deposits is a fragment of a hollow discoidal ear pendant of ground and polished calcite. This fragment was excavated at the San Juan site. In section it is 1.5 centimeters thick and 1 centimeter wide. If the arc of the fragment is extended into a circle the entire diameter of the ornament would be 6 centimeters (2.4 inches). A deeply incised groove (0.5 centimeter) has been excavated from the center of the outer surface, leaving two outer rim flanges. Sides and inner surface of the ornament are flat and plain. It is not clear just how this ear ornament was worn, whether the lobe of the ear was pierced and the stone disk inserted within the enlarged lobe, or whether a suspension attachment was employed for fastening the object as a pendant. Figurines in clay and amulets in wood or shell show a characteristic enlargement of the lobe of the ear, leaving a circular opening, possibly representing the wearing of ear labrets. The ornament is figured as 11 of Plate 9.

Decorative tendencies of all known primitive peoples apparently include some form of neck ornament in the form of beads or pendants. In Plate 10 are illustrated the several forms of beads in shell, stone, and bone recovered from Samaná by the Museum expedition. Cylindrical beads of chalcedony, greenstone, and other hard stones resembling those from Samaná are found on all the Greater Antilles. The beads show drilling from both ends. Where the beads are 1 or more inches in length drilling with stone drills of calcite, combined with the use of sand, formed a biconical perforation quite irregular in appearance. It is noteworthy that the stone beads recovered from the burial offerings on the south shore of the bay are shaped from varieties of stone not occurring locally. Transversely, perforate beads of shell recovered from sites on either shore of the bay and on the north coast of the peninsula, also tubular beads of polished stone from these sites reveal a similar identity of form.

There are apparently two types of stone beads characteristic of northeastern Santo Domingo. The long, tubular variety, with an embossed central section and slightly raised end sectors or rims, and the shorter plain surfaced tubular stone bead. Each of the stone beads illustrated in Plate 10, except 2, are of soapstone or greenstone and are highly polished. No. 2 is an unfinished, imperforate tubular bead of limestone. A beginning had been made at perforation by drilling and the hole at one end has progressed 2 millimeters. This

bead (Cat. No. 341011, U.S.N.M.) is 3.5 centimeters (1.5 inches) long and 1.7 centimeters (0.7 inch) in diameter. Its resemblance in form to the completed greenstone tubular bead 11 of Plate 10 is apparent, although it was recovered at San Juan, on the north coast of the peninsula, while 11 was recovered with the sievings at Upper Orange Key, on the south shore of Samaná Bay. This latter tubular bead (Cat No. 341070, U.S.N.M.) has several incised lines encircling the surface. The lines are crudely fashioned and are not accurately drawn. The smaller plain-surfaced tubular bead (Cat No. 341069, U.S.N.M.) are figured as 10, 12, and 13 of Plate 10. They are of a greenish soapstone, but are very irregular as to form. The outer surface is not symmetrically rounded, as in 2 and 11; neither are the end sectors or edges even. The durable stone appears to have been cut with great difficulty; likewise has the axial drilling of the perforation for suspension been laborious with the tools at the disposal of the aboriginal jeweler. In 11 the perforation is fairly uniform, with a diameter of 0.5 centimeter, while the perforation in the shorter beads, 10 12, and 13, is slightly larger (0.6 centimeter) and more irregular. In 12 and 13 two or more false starts and incomplete drillings may be seen along with the finished perforation. The length of the perforation to be excavated with the primitive drilling tools of the Taino was a serious technical problem. Bead 11 is 3.4 centimeters (1.3 inches) long, while 10, 12, and 13 are 1.8 centimeters (0.7 inch) in length.

Among the articles recovered with the mortuary offerings at the rock-cleft burials on Upper Orange Key is a tubular object of worked calcite (Cat. No. 341009, U.S.N.M.). This object is illustrated as 6 in Plate 9. It is 4.5 centimeters (1.8 inches) long, and 0.7 centimeter in diameter at the base, but tapers to a 2 millimeter point. This tubular object had been used as a perforator or drill, twirled with the thumb and fingers. Its diameter is too great to permit its having been used to excavate the perforations of the greenstone beads figured in Plate 10, but it might very well have been used for a part of the work. An attempt was made by the writer to use the calcite perforator as a drill in this fashion, with considerable success. Although calcite does not occur on the south shore of Samaná Bay, many fragments were found with the burial offerings in the dry rock cleft of Upper Orange Key. Smaller drills of calcite were probably used to make the excavation in holes requiring a tool with smaller bore. Calcite fragments were valued by the aborigines because of the smooth cleavage planes of the calcite crystals. An interesting observation was the find of many fragments of calcite in the kitchen midden at San Juan, on the north coast of the peninsula. One of the fragments had been perforated near one end with a transverse, biconical, hourglass-shape hole for suspension

as a pendant. Calcite is not found in a native state within the area, although it occurs in the mountains of the Cordillera Setentrional farther to the west.

Pottery.—Earthenware forms and decorative designs on pottery from eastern Santo Domingo have been described by Dr. J. W. Fewkes,[22] Sir Robert Schomburgk, Theodore De Booy, Sven Loven,[23] and others. Pottery forms, however, and decorative designs of the Ciguayan Indians of Samaná have never before been studied as a unit in Ciguayan culture. The nearest approach to an intensive study of pottery forms from eastern Santo Domingo was that of Theodore De Booy, who explored cave middens and excavated cultural deposits within the boundaries of the aboriginal Province of Higuey, in southeastern Santo Domingo.[24]

It will be seen at once that the earthenware vessels and shards illustrated in Plates 14–27 of this monograph are for the most part characteristically Tainoan, as repeatedly described by students of the archeology of the Greater Antilles. The many unusual and hitherto undescribed forms from the San Juan site are less readily classified. Enough divergent forms were there uncovered to justify the assertion repeatedly made by the natives of other aboriginal Provinces of Haiti that the Ciguayan Indians were foreigners. Columbus found it possible to muster the aid of native caciques and of 3,000 warriors from Marien in his campaign against the Ciguayans, who spoke a "lengua extrana y barbara."[25]

Pottery objects from three distinct local areas in Samaná were collected by the Museum expedition and forwarded in part to the United States National Museum, and in part to the National Museum of the Dominican Republic at San Domingo city. The sites explored are the caves on the south shore of Samaná Bay; the village site at Anadel, on the southern slope of Samaná Peninsula; and the large village site at San Juan, on the northern coast of the peninsula, each of which yielded potsherds of somewhat different description. The San Juan site yielded the greater variety of pottery fragments and complete vessels in form, paste, technic, and decorative design.

Pottery from the caves.—Forms represented in the cave finds are largely conjectural, as only a few shards of sufficient size were recovered to clearly establish the type. Then, too, most of the ware recovered from the caves is undecorated. The more common relief embellishment on the few decorated shards recovered is a sharply defined thickened rim section, formed either by luting on of an

[22] Twenty-fifth Annual Report, also Thirty-fourth Annual Report, Bur. Amer. Ethn.

[23] Ueber die Wurzeln der Tainishen Kultur, Goeteborg. 1924.

[24] Pottery from Certain Caves in Eastern Santo Domingo, West Indies. Contributions from the Heye Museum, No. 9, 1915. Also, Santo Domingo Kitchen Midden and Burial Mound. Indian Notes and Monographs, New York, 1919.

[25] La Historia de Espaniola, p. 120.

additional reinforcing ribbon of clay around the outer rim circumference, or through the use of a thicker coil to complete the rim of the vessel. The sharply defined thinning of the walls of the vessel just below the rim margin may be seen in 3 of Plate 20 (Cat. No. 341025, U.S.N.M.).

Shards of globular shallow bowls were recovered at "Railroad" cave, while fragments of incised line and of punctate decorative patterns were picked up at the site of the burials on Upper Orange Key and in the kitchen middens in "Simmon's" cave. Ordinarily the cave pottery from Samaná is plain, well-fired red ware, for the most part unpainted, but revealing patches of a firmly incrusted red or lavender hued slip or paint. Many of the shards are thin-walled, but occasionally an unusually thick fragment appears. A few plain-necked water-canteen fragments were recovered from cave 3 (Boca del Infierno), while a few shallow globose bowl fragments similar to the shallow Tainoan ware from the peninsula were uncovered from the midden in the "Railroad" cave.

One well-fired globular brick-colored bowl was dug up from Upper Orange Key (Cat. No. 341056, U.S.N.M.). Quality of the paste and the firing is superior to the more granular shards recovered from the ordinary Taino site. The bowl is 14 centimeters (5.5 inches) in diameter and 12 centimeters (4.7 inches) high. The ¾-centimeter-thick walls have a coating of ashes and lime. A similar incrustation adhered to the inner and outer walls of pottery objects recovered from the two Orange Keys. Incrustations due to the dripping of lime-impregnated water from the cave ceiling of Boca del Infierno cave also adhered to the shards recovered from the cultural deposits there. Shards from the vicinity of the hearth on the cave floor are thickly coated with carbon, bespeaking their former use as cooking vessels. The small number of canteen fragments from the caves is remarkable in view of the fact that drinking water had to be carried to the caves from a distance of one-half to 2 kilometers.

Food bowls from the burial cleft of Upper Orange Key with few exceptions, were broken beyond recognition of their original form. It is probable that some of the pottery fragments found with the burials were used as funerary urns in which the skull and long bones were placed.

Characteristic of the form of pottery from the caves are such details as handles or lugs of flat ribbons of clay and raised rims. These lugs are not luted on to the vessels after the fashion of the usual Tainoan ware but form an extension of and are incorporated in the coil block of the vessel.

Shallow bowls and food dishes from the caves and from sites on the peninsula are not always oval or spherical. Rectangular vessels have raised rim sections alternating with depressed sections. The

elevated portions are at the ends if the vessel is oblong and also bilaterally if the vessel is rectangular. A peculiar reinforcement of the walls of the body of certain forms of earthenware vessels is noted in the parallel series of raised ridges extending from the rim coil vertically to the shoulder. These upright ribbons of clay are utilized as surface decorative embellishments and always terminate at the highes point in vessels with raised rim sections. In 1 of Plate 20, Cat. No. 341025, U.S.N.M., a conventionalized animal figurine reinforces the highest section of the rim or lip. Similar upright or vertical reinforcement ridges are also illustrated in at 2, of Plate 14.

A fragment of a large deep bowl was recovered from the hearth at "Raiload" cave. The fragment was incrusted with soot and charcoal, which when removed revealed a bright brick-red color. This, as also other fragments, show the use of a slip, while other shards betray undoubted evidence of the application of a reddish paint.

The large bowl, Cat. No. 341055, U.S.N.M., figured in Plate 14, was recovered from under a mass of bowlders in Boca del Infierno cave, where it had originally been placed either to collect the water dripping from the roof of the cave or for safe-keeping. As no other vessels were similarly hidden away on ledges or elsewhere within the cave, it is probable that it had been placed there to collect the slowly dripping water from the cave roof. The bowl or vase is globular in form, plain as to decorative designs, except for a panel of incised lines on the incurved shoulder just beneath the vertical neck section. The rim is plain and vertical, being neither incurved nor flaring at the rim. The body of the bowl is that of a flattened globe and has a flat bottom which curved slightly upward at its center.

The decorative panel on the incurved shoulder is characteristically Tainoan and is made up of altering horizontal and vertical lines in series of five or more in parallel. Both horizontal and vertical lines are terminated by a shallow pit. At the level of the decorative panel and luted on bilaterally as handle lugs are two clay zoomorphic figurines of the so-called "monkey" type. The upper and lower portions of this type of clay figurine stand out in high relief while the central area is markedly depressed. The simplicity of the technic employed in shaping the figurine is remarkable because of its effectiveness. Four parallel horizontal incised lines of two different lengths are introduced on the surface of the figurine, the shorter at top and bottom, with the longer lines traversing the central area of the figurine head. These lines are terminated with punctations or shallow pits in typically Tainoan style.

In color the vessel is a light buff with an overlay of carbon from repeated firing. The bottom of the vessel has become weakened from weathering and penetration of foreign substances. About one-third

of the inner sectional diameter of the walls of the vessel remains unfired. The paste is there revealed as a black, porous earth, heavily impregnated with particles of steatite and potsherds, constituting a tempering material. The earth from which the vessel was built up is apparently that of the Samaná peninsula and is not from the vicinity of the caves on the south shore of the bay.

San Juan pottery types.—Three small bowls characteristic of the pottery from the San Juan site are illustrated in Plate 14. The boat-shape vessel, 1, resembles boat-shape earthenware types from Jamaica and Porto Rico, but is more nearly identical with a food bowl recovered by De Booy from the caves at Salada, in southeastern Santo Domingo. This bowl, Cat. No. 341019, U.S.N.M., is reddish brown in color. Broken sections of the walls reveal an unfired area of black earth at the center of the walls similar to that of Cat. No. 341055, U.S.N.M., figured in Plate 14. The bowl is oblong, like a boat, with a high prow and stern. The elevated rim section at either end is terminated with a clay figurine in conventional design peering outward. Features of the figurine are indicated by means of shallow pits without the introduction of connecting lines. A border of incised parallel lines beginning at a terminal pit is continued as a concentrically recurved series of four parallel lines. The bowl below the shoulder angle is plain. A small flat bottom covers a diameter of but 4.5 centimeters (1.8 inches), while the length of the bowl at the shoulder is 14 centimeters (5.5 inches). The width is 13.5 centimeters (5.3 inches); it is 4.5 centimeters (1.8 inches) higher at the ends than at its center, where it reaches the height of 7.5 centimeters (3 inches). Food bowls 2 and 3 of Plate 14 are, so far as the writer is aware, new and heretofore undescribed, although some of the pottery handles excavated by Doctor Fewkes and figured in the Twenty-fifth Annual Report of the Bureau of American Ethnology are similar to the parallel luted ridges shown in the two compartment food vessels. (No. 2, Plate 14.) From the descriptions of Doctor Fewkes and from the pottery fragments illustrated in Plate 73 of the Twenty-fifth Annual Report of the Bureau of American Ethnology, much of the ware, especially the plain handles and handle lugs from San Juan (pls. 25 and 26), resemble and in many cases are identical with those from the Cueva de las Golondrinas of Porto Rico. Hundreds of shards, consisting of raised pottery surfaces constituting handle lugs or animal heads, with mouth and eyes incorporated, are shaped from the same coil, constituting an extension of the body of the bowl itself, and are not luted onto the vessel, as are the characteristically Tainoan figurines heads. This is a Carib rather than a Tainoan form of decorative design, but is here described from a typical Tainoan site,

while Doctor Fewkes describes the type of raised handle excavated in the Cueva de las Golondrinas, near Manati, as follows:

> The handles are in general similar, and evidently belonged to coarse bowls, vases, and ollas. In similar forms a raised ring of clay served all the purposes of a handle, but there were often added grooves with adjacent elevations. The handle was sometimes broad and flat, at other times narrow and round. One of the specimens * * * has two solid knobs on the rim; another is perforated just below similar knobs. The edges of the handles of many vessels are pinched into ridges that may be corrugated, notched, or serrated.
>
> Hardly any two handles are exactly alike; * * * These show that there was an abundance of red ware. The surface of this pottery in one or two instances is smoothly polished.[26]

Pottery types from the cave deposits were fewer than from the San Juan site which yielded a considerable variety of forms, decorative designs, and an abundance of material from which selections were made for the Museum collection. The striking similarity of certain types of San Juan pottery to the ware figured by Doctor Fewkes from the Cueva de Las Golondrinas in Porto Rico sets this type of pottery as distinct from the usual Tainoan decorated ware both as to form, color, and decorative embellishment (pl. 25). In addition to the Golondrinas type of pottery there were recovered at San Juan food bowls resembling the Salado ware described by De Booy from near Cape Macao, Santo Domingo. This type of pottery is typically Tainoan, but is specifically characterized by curvilinear incised lines terminating in characteristic shallow pits. To this type belongs the boat-shaped food bowl (pl. 14, No. 1).

Quantities of typical archaic clay figurine zoomorphic and anthropomorphic heads, together with surviving fragments of shallow food bowls, were recovered at San Juan in quantity. Examples of these figurine heads are illustrated in Plates 16–27.

Characteristic of the Golondrinas type (pl. 25) of red ware but also characteristic of many similar fragments from San Juan is the double-compartment food bowl, 2, Plate 14, Cat. No. 341021, U.S.N.M. The bowl is painted red ware having a dull-brown slip on its inner surface. Unfired areas within the walls are revealed by broken fragments and show the paste as the usual type of black earth impregnated with a profuse tempering of minute fragments of steatite pebbles and of white sand. The bowl is 16.8 centimeters (6.6 inches) long, 6.6 centimeters (2.6 inches) high, and 13.3 centimeters (5.2 inches) wide at the center of each compartment. As

[26] Twenty-fifth Ann. Rept. Bur. Amer. Ethn., p. 181. NOTE.—A simliar type of pottery embellishment occurs on boat-shape funerary vessels from caves near Kingston, Jamaica. In the Jamaican forms three buttons or knobs are placed in series of three at the raised ends of the oblong vessels. Another design is in the form of a crescent-shape ribbon of clay surrounding a central knob. This Jamaican earthenware, like that from San Juan, has exceedingly thin walls. No characteristically Tainoan figurine heads occur.

to paste and tempering materials, therefore, the red ware from San Juan is similar to the usual Tainoan earthenware from the same area. In form, however, and in the application of a red slip or paint and in the firing the type is foreign to the regular Samaná earthenware. The walls of the vessels of this red ware are much thinner, the firing has progressed to a more thorough stage, and the introduction of the central diaphragm separating the vessel into two oval compartments, together with the luting on of vertical bands of clay bilaterally near the rim of either compartment—all these characteristics are foreign to the usual type. The walls of the vessel are thicker at the center near the sectional diaphragm dividing the vessel into two compartments. The vertically luted and ridges ribbons of clay which appear near the upper surface of the bowl in pairs bilaterally at the center of either compartment are possibly decorative lugs. In fragments of other vessels recovered these lugs are not luted onto the side walls of the vessel but are merely vertical extensions of the upper or rim coils. The lugs then appear as modelings of animal heads in a style distinct from the archaic figurine heads well known as Tainoan. In this type of plastic sculpturing in clay, which is new to science from the West Indies, the modeling of life designs is incorporative; that is, the figures are not merely luted on but are an essential part of the vessel, as in the ancient pottery of the Cauca River Valley of Columbia (pl. 25).

A unique form of thin-walled red-ware vessel from the San Juan appears as 3, Plate 14 (Cat. No. 341020, U.S.N.M.). The vessel is almost a perfect sphere and is symmetrically rounded. The walls are plain, but are unique in that they terminate abruptly with the incurved shoulder and have no neck area or marginal reinforcement. The bottom of the vessel is flat and constitutes another hitherto undescribed type of earthenware vessel from the West Indies. Dimensions: 12 centimeters (4.7 inches) in diameter; height, 8.5 centimeters (3.4 inches). Orifice at the top is 4 centimeters (1.6 inches) in diameter. Paste and tempering are similar to the usual type of earthenware from the peninsula.

Pottery stamps and miscellaneous objects.—Discoidal incised earthenware objects from sites in eastern Santo Domingo have been described as pottery stamps. It has also been conjectured that they may be cassava graters. One of the group, illustrated as 6, Plate 17, No. 341023, U.S.N.M., is obviously neither but is a spindle whorl of simplest form. It is fragmentary, but sufficient material remains to identify it as such. There is no design incised on its surface, as with the others shown on the plate. Its diameter restored is 8 centimeters (3.2 inches); thickness, 1.3 centimeters (0.5 inch). The hole at the center is 1.4 centimeter (0.5 inch) in diam-

eter. The material used is similar to the paste employed in the majority of objects recovered from San Juan, where this whorl was excavated. Tempering material is also similar and consists of many granular particles of sand and gravel and bits of crystal quartz.

Other objects figured in Plate 17 are more problematical. The designs vary, some being rectilinear incised converging at a common center; others being partly curvilinear and extending across the surface transversely; still others being small punctations divided into panels with a grooving stick; and one introduces deep pits more or less evenly spaced. It is probable that these various pottery forms represent objects used in games. This guess may stand until better or more convincing evidence to the contrary is forthcoming. The average diameter is 7 centimeters (2.7 inches); thickness, 1.5–2 centimeters (0.6–0.8 inch). Some of the figures are incised on either lateral flat surface; others are plain on the reverse. When designs are applied to both flat surfaces they differ one from another in each instance. This would scarcely be necessary with a simple utilitarian implement. If 3, for example, were a stamp, then the impressions made by it would be in relief. No fragments of decorated ware were recovered at San Juan showing such raised dots except one (Pl. 18). This can be accounted for in another manner. In Plate 18 are illustrated a series of pottery fragments incorporating decorative designs consisting of series of pits. One of these fragments, 1 of Plate 18, Cat. No. 341039, U.S.N.M., shows parallel rows of shallow pits evenly spaced. These pits were made with a blunt end of a stick, but were applied with such force as to make a corresponding raised dot on the reverse surface of the potsherd. The raised figures on the reverse or inner surface of No. 1 are thus explained as not having been fashioned with a pottery stamp similar to 3, Plate 17.

Fragmentary shards of coiled ware with punctated surface designs appear in Plate 18 as 2, 3, and 4, Cat. No. 341039, U.S.N.M. All have a surface color of dull-brick brown, but have been blackened by use on one or both surfaces. No. 3 has pitted decorative designs appearing on the inner surface of the fragment; others have the design on the outer surface. No. 4 is unique in that the pits are excavated from a ridge or shoulder appearing on the surface of the shard near the bottom of the vessel. This is an archaic type and constitutes a survival in decorative design from the earliest archaic forms of decorative embellishment on pottery vessels. It appears on forms of South American pottery, espécially from Venezuela and Colombia.

Crosshatching and stone collar decorative designs.—A form of decorated ware from the West Indies hitherto undescribed occurs in

two shards from a shallow food bowl illustrated in Plate 18 as Nos. 6 and 7, Cat. No. 341039, U.S.N.M. The decorative design on the incurving surface above the shoulder of the bowl appears to have been made with crosshatching from a rather broad-headed spatula for the vertical and a narrower spatula for the lighter or horizontal designs. Portions appear to have been molded on a basketry base. If this is so the embellishment constitutes an unusual type.

An interesting coincidence in design appears in the stone collar representations illustrated in Plate 19 as 1 and 2. Doctor Fewkes in the Twenty-fifth Annual Report of the Bureau of American Ethnology at considerable length demonstrates how designs sculptured on stone collars are similar to pottery figurines appearing as "grotesque" anthropomorphic or zoomorphic designs on handle lugs. Fewke's analysis of the designs on stone collars has a bearing on the explanation of the ceremonial and religious life when we consider how the identical decorative embellishments appear on the surfaces of earthenware vessels. A new element in the expression of aboriginal Ciguayan art designs appears in the pottery fragments 1 and 2 of Plate 19, where the decorative design incorporates the outline figure of a stone collar. No. 1 shows a simple outline of a stone collar without decorative embellishments; 2 introduces the peculiar knotted section as it appears on stone collars. Mason describes this part of the collar as the shoulder ridge. The double-shoulder ridge, as it is represented on the pottery fragment 2, recalls the older form of wooden collar and might serve to illustrate the knotted withe where the two ends of the wooden collar were joined. Thus the same motive of design which first produced a knotted ridge where the two ends of the wooden collar were joined later reproduced the same relief pattern in the collars of stone, and finally the entire figure of the collar reappears as a decorative embellishment on an earthenware handle lug. (Cat. No. 341026, U.S.N.M.)

Rattles.—Characteristic of Tainoan potter's art is the occasional shaping of a hollow cylindrical lug and the placing within it of a small pebble. Cylindrical rattle lugs are not common or of frequent occurrence in the Samaná area, although two were recovered at the San Juan site. One of these, Cat. No. 341038, U.S.N.M., is a simple globular-shape lug luted onto the side of a pottery vessel. Where the hollow cylinder lug had been closed after insertion of the rattle pebble is a narrow clay band pilastering. Another hollow rattle lug, Cat. No. 341038, U.S.N.M., is shaped in the form of a bird's head. This figure is illustrated as 5 on Plate 18. Bill or beak and eyes are not shown in the illustration. Feathers are represented as raised ridges and by concentric curvilinear parallel grooves. On the centrally placed ridge appear a number of shallow punctations intended to represent the wattle of some species of wattled bird.

Water bottles.—Earthenware water bottles with regularly formed necks occur only in Haiti and have not been recovered from any other of the islands of the West Indian Archipelago. Water bottles of earthenware are found in several culture areas of North and South America, but not in middle America. The huastekan type of water canteen with its long oblique neck section is dissimilar to the Samaná types, of which apparently there are two. The simpler of these, of which a large number were found at San Juan, has a plain, short, cylindrical, constricted neck section. The other more artistic and highly specialized type has a long neck with a knobbed or bulbous rim. An anthropomorphic or zoomorphic face is molded as a decorative embellishment of the lower neck section; the upper portion of the neck area has a circular spherical enlargement. This type of water bottle does not occur anywhere in North America, but does reappear in the Andean region of South America. A third characteristic, that of arched mammae on the body of the water vase or bottle appears alike in Ciguayan and Panaman water bottles.[27] "A human effigy vase (Tule Indians of the San Blas coast, Panama) for storing chicha is made of black ware, heavily stained with chicha and uniformly blackened from smoke. The general form of the vase is spherical, with a constricted, tubular neck orifice elongated to one-third the total height of the vessel. A combination of coiling with modeling by the potter's hand, aided with a calabash shell and a knife, was the method employed in its production. The human facial features stand out in low relief filleted on the surface of the neck piece, as are also the arm representations on the walls of the body of the vessel, an ornamentation technique reminiscent of ancient Chibcha ware from Colombia."

The description of an effigy canteen from Panama is similar to that of Cat. No. 341038, U.S.N.M. (No. 3, pl. 16) from San Juan. This type of canteen differs from the other Ciguayan forms in that the features representing the anthropomorphic design are luted on the spherical body of the vessel rather than to the constricted neck section. The eye appears as a circular raised coil or ribbon of clay with a central shallow pit; the nose is straight and prominent, forming a clear-cut wedge; the mouth area is an oval strip of luted-on clay, across the center of which is a deep incision. The ear likewise appears as a raised and slightly curved strip of clay luted vertically on the sloping shoulder of the vessel.

Similar canteens, without the narrow necks of the Antillean ware, have been found on the Gulf coast of northwest Florida. Water bottles also have been recovered from the mounds of middle Missis-

[27] Culture of the People of Southeastern Panama, Bull. 134, U.S.N.M.

sippi, from Louisiana, and from Moundville, Ala. Other similarities of Moundville pottery with that from the Greater Antilles might be pointed out.

Orifice rims and decorated neck sections of pottery water canteens and water bottles were found at Anadel, San Juan, and in the cave deposits. Many of these were simple tubular coiled blocks with an enlarged or reinforced rim which was rounded on its surface. Similar plain water bottles were discovered in quantity at San Juan, a smaller number at Anadel, and only a few at the "Railroad" cave. The upper portions of the water bottles figured in Plate 15 are from a thick-walled type of water container, shaped from a gray colored granular paste, different from the black loamy clay paste from which most of the vessels and potsherds of Samaná had been fashioned. In Plate 15, Nos. 1 and 2 are from San Juan, while 3, Cat. No. 341037, U.S.N.M., is from Anadel.

The enlarged rim section of 3 resembles that of most of the plain water-bottle rims, while the rip and upper section of 2 is more elaborate.

The bottles figured in Plate 15 reveal a paint in two colors, a creamy white and a salmon color. In 1 the contrast between the two colors used is marked. A white slip, perhaps of kaolin, had been applied. This has in part disappeared, thus giving the peculiarly spotted appearance noted. In 1 an animal figurine head had been luted at the side and stands in high relief at the side of the neck section. The figurine is the characteristic so-called "monkey" type, in which features are represented by transverse lines, the eye by incised circle and dot, while the nose is realistically done and shows a wide nostrility. Other decorative attempts consist of raised ridges traversed by wide incised lines. The outline of the bottle appears to have included two or more globular expanding and contracted areas beginning with a globular or bulbous enlargement of the lower neck area.

In its outline the form of 2 is distinct and more Tainoan. It was recovered from the San Juan site. Concentric curvilinear lines at the top are terminated with shallow pits, as in the food bowl 1, Plate 14, and are filled in with concentric triangularly incised lines. A raised disk-shape surface at the side of the head of the bottle quite near the rim may have served as a rest when the vessel was tilted. It is impossible to explain the raised disk as an element of decorative embellishment. The rim orifice is narrow, 2 centimeters (0.8 inch) in diameter. This is identical with the diameter of the orifice of 3, which was unearthed at Anadel. Tapered walls of the neck area are plain, except for the luted figurine head apparently wearing a headdress and having pierced ear lobes.

The neck and head of canteen 3, Plate 15, Cat. No. 341037, U.S.N.M., has a raised rim, well rounded and tapered from the orifice to the neck area. The globular expansion of the walls of the lower neck is again apparent in this specimen. It is also studded with raised surfaces and decorative figures. The walls again become constricted before merging with the walls of the body of the vessel.

In the canteen under description there is a raised disk appearing on the rim section, shapped in the form of a circle and dot. This becomes the head of a figurine, the legs of which appear at the sides of the neck. Another raised disk on the lower neck walls becomes the umbilicus of the figurine. The interior of the neck of the vessel shows how elaborately fitted together are the several luted-on parts of the decorative embellishments. The vessel is an excellent example of Antillean potter's art, but apparently does not belong to the primitive Ciguayan type of water bottle, which was plain and of unpainted red ware.

Archaic clay figurine heads.—It has been the customary thing to refer to the typical Tainoan clay figurine heads as "grotesque." It is apparent that such a term is misleading, in that the "grotesqueness" is due not to intentional deformation or distortion of heads from clay but is due to the technic of the primitive plastic artist following conventional lines of sculpturing and modeling of facial features or even of an entire figure. The rules are so simple as to make a realistic portrayal impossible. Use of incised lines and pits surrounded with ridges are the only means employed to achieve highly artistic results. To be sure there is a rough modeling of the head with frontal, orbital, nasal, and chin eminences well marked. Even such details as ear appendages are modeled out of the solid, but as a rule the eyes, eyelids, nostrils, lips, teeth, headdress, convolutions of the ear, the ear lobe, and mouth are represented by simple luting on of applied ribbons of clay in curvilinear or rectilinear designs, as the artist's motive demands.

A group of somewhat different type of design of modeling appears in the three heads illustrated in Plate 16. With this group should be considered 6 of Plate 19. The technic is the same as for the type of clay modeling just described, but the results are somewhat different. It is in the detail, size, distortion, or rather exaggeration, together with the addition of certain details not usually included in the small clay figurines. One of these details, exaggerated in the figures illustrated, is the shape of the ears. The form of modeling in each of the four figures illustrated varies. For 1 in Plate 16 the ear convolutions are represented by two concentric oval ridges alternating with two incised grooves, the inner of which is a straight line. In 2 on the same plate the ear is more realistically

modeled, with a central depression and a usual outer raised rim. The lobe is pierced transversely for insertion of some ear ornament. In 1 the lobe is represented as having inserted in it a discoidal ornament with a centrally excavated pit. In 3, Plate 16, the ear is again conventionally designed, in that the ear is represented as a vertical incised groove surrounded with a raised rim appearing less regularly geometrical and rather more realistic than that of 1, Plate 16. The lobe is formed of a long ribbon of clay luted on at an obtuse angle to the ear proper. This form of modeling was due to the exigencies of a spherical surface, the figure being applied to the upper shoulder of a large canteen. Both 2, Plate 16, and 6, Plate 19, are modeled on a flat surface, designed to be luted on to clay vessels. No. 1, like 3, Plate 16, is modeled in the round, 3 being part of the surface of a globose vessel, while 1 was probably luted on to the curved surface of a large-necked water bottle.

Two types of eye modeling may be observed in the four figures under discussion. In 1, Plate 16, and 6, Plate 19, the eyes are formed with a raised ribbon of clay in roughly circular position. The ridge is flat and is surrounded with an incised circular depression; within is a circular depression or pit. In 2, Plate 16, and 6, Plate 19, the eye is represented with a distinctly bulging expression, due to the beveled surface of the circular ribbon of clay. The pit is also smaller, and the outer or surrounding incised groove is lacking.

Nose modeling ranges from a simple bulbous excrescence, as in 1, to the straight and rather prominent type of nose to be seen in 2 and 3, Plate 16. In 2 two narrow pits are excavated in a more realistic manner than is usually seen in Tainoan clay figurines. No. 6, Plate 19, introduces a new form of nose modeling in the triangular excavation underneath the nasal eminence. The entire figure assumes an owlish cast because of the series of concentric ridges and grooves. In each of the four figurines illustrated, with the exception of 1, Plate 16, the mouth and lips are represented by two parallel transverse or horizontal ridges divided by a sharply defined incised depression. In 1, Plate 16, teeth are represented by a set of five vertical ridges alternating with a corresponding number of depressions, the whole surrounded with an incised groove.

The clay used in modeling 1 and 2, Plate 16, is distinct from the clay used in modeling much of the ware from the San Juan site. Dimensions of 1, 5 centimeters (2 inches) high and 7.3 centimeters (2.9 inches) wide; of 2 5.5 centimeters (2.2 inches) high and 8.4 centimeters (3.3 inches) wide; of 3, 7.3 centimeters (2.9 inches) high and 12.5 centimeters (4.9 inches) wide; of 6, Plate 19, 9.3 centimeters (3.7 inches) high and 6 centimeters (2.4 inches) wide.

The four figurines under discussion were recovered from the deposits at the site of San Juan, on the north coast of the peninsula, and are entered in the Museum records as Cat. No. 341038, U.S.N.M.

It is apparent that these clay objects were not fashioned at San Juan, where they were found, and that they were brought from a distance. This evidence of trade in aboriginal Haiti is further verified in the unusual type of modeling, the application of variously colored paints, and the foreign type of clay paste employed in the water bottles from San Juan and illustrated in Plate 15. If archeological research had progressed as far in the West Indies as in the southwestern United States in the study of native pottery forms there is little doubt but that the provinance of such types as those just described might be given. It is necessary to be able to do this before important points bearing on migration, culture sequence, and relative age may be solved.

Pottery pestle lens.—Dr. J. M. Fewkes classifies the stone pestles of the Greater Antilles, according to their component parts, as grinding surface, termed the lens; the handle; the ferrule; and the head. As mentioned previously, the stone pestles from Samaná have no decorative head figurine, and in other respects resemble the stone pestles of the Caribs of the Lesser Antilles. Two other kinds of pestles were found by the Museum expedition in Samaná: one of shell, Cat. No. 341004, U.S.N.M., illustrated as 5 on Plate 9; the other of earthenware, Cat. No. 341022, U.S.N.M., and not figured. Only the lens and a section of the handle of the latter were recovered. The lens is developed somewhat in the form of a door knob, while the handle shaft is narrow. It is broken off 5.5 centimeters (2.2 inches) above the base. The diameter of the lens at the base is 6 centimeters (2.4 inches). The base is smooth and shows no evidence of use as a triturating or grinding pestle. The paste of which the pestle fragment is shaped has been tempered with pulverized potsherds, bits of shell, stone, and sand. The handle shaft does not project from the exact center of the lens and so betrays a crudity in free-hand molding. Most pestles from Haiti have a well-developed lens, whether the media be stone, shell, or earthenware. The aborigines of Samaná probably used the earthenware pestle as a cassava, food, or pigment grinder. Although fashioned of nondurable material, the earthenware pestle is much larger than the pestle of carved shell, Cat. No. 341004, U.S.N.M., which is but 4.5 centimeters (1.8 inches) long, and has a lens of 1.5 centimeters (0.6 inch) diameter.

Rims and lugs.—In Plates 19 and 20 are illustrated a series of pottery rims and handles of a decorative pattern typical of the Tainoan ware from the Greater Antilles in general. If the region were better known archeologically it is safe to venture the assertion

that even from the simple selection illustrated in this monograph a variation of forms and designs representing distinct culture influences and periods might be recognized. The unusual features of 6, Plate 19, have been considered. It is also possible that 7 and 8, Plate 19, represent a variation in type indicative of influence from without the peninsula. Nos. 5 and 9 are readily recognized as typical of the generalized Tainoan form of anthropomorphic or zoomorphic figurine head. No. 5 is represented as peering into the shallow vessel, while 9 is molded as to look away from the earthenware vessel on which it is luted. The more decorative form of handle illustrated as 4, on Plate 19, Cat. No. 341025, U.S.N.M., has also been described by Doctor Fewkes from Porto Rico, although the type is common to the San Juan site in Samaná. The use of the raised circle and dot in a novel manner is very effective and is repeated in 5 on Plate 20, Cat. No. 341025, U.S.N.M.

In 3, Plate 20, a unique representation of a manatee is illustrated. One flipper appears emerging from underneath the head of the figure. Nothing more is presented. This omission of nonessentials is a method of artistry typical of several groups of aboriginal Indians. The tribes of the Pacific Northwest coast practice the same technic in their wood carving when representing their totemic animal crests.

Generally it is impossible to recognize the species of zoomorphic figurines modeled in clay by the aboriginal potters of Samaná. It is occasionally possible, however, to identify a figurine as the representation of one of the various groups of animals as mammal, bird, fish, sea or land mammal, or as anthropomorphic; more definite identifications are almost always untrustworthy because of the conventionalized technic of the artist. Undoubtedly some of the figurine heads are intended to represent zemis or personal totems belonging to an individual, family, or clan. Undoubtedly, also, some of the figurines heads which resemble animal heads in their form are conventionalized presentations of the human head, and, conversely, the realism of design bespeaks an old and deeply rooted culture, not necessarily a high culture, but one thriving throughout a long period in isolation. Realism in decorative design, then, often assumes no particular significance, but is simply presented and without ceremonial importance.

It is impossible, for instance, to determine whether 4 and 5, Plate 20; 4, 5 and 9, Plate 19; and 2, Plate 21, were intended as zoomorphic or anthropomorphic figurines. It is possible that the personages or creatures represented are for the most part ceremonial and belonged to the social and religious life of the tribe. In other words, the vast number of modelines and decoratives designs in clay chiefly

in the form of figurine heads luted on earthenware vessels of various descriptions are purely formal and must be considered figments of the imagination of the aboriginal artist. As in other aboriginal culture areas, the relationship between animal forms, including representations of the human figure and creatures of the spirit world, is close, indeed. The services of the individual worker in clay were utilized to crystallize these forms and to give them shape. In so doing the artist's imagination was given little choice. Conventionality played the major rôle, as it always has in any creation of totemic art.

Petroglyphs and pictographs.—Friar Ramon Pane writes that natives of Haiti carved images of their zemis on rocks in caves. It is known that stalagmites were employed as media for representations of zemis in stone. This form of stone sculpture has come to be known as "pillar stone carving." Pane relates[28] a Haitian tradition regarding a—

> Province in Hispaniola called Caanan [sic], in which there is a mountain call'd Canta, where there are two grots or caverns; the one called Cacibagiagua, the other Amaiauva; most of the people that first inhabited the island came out of Cacibagiagua. These being in those caverns, kept watch by night, and one Marocael had the charge of it, who coming one day too late to the door, they say the sun took him away. Seeing therefore that the sun had carried him away for his neglect, they shut the door against him, and so he was turned into a stone near the door. * * * They say, therefore, that the sun and moon came out of a grotto, that is in the country of a cacique, whose name is Maucia Tiuvel, and the grotto is called Giovovava; and they pay a great veneration to it, and have painted it all after their fashion, without any figure, but leaves, and the like. In the said grotto, there were two little stone cemies, about a quarter of a yard long (shaped from stalagmites), their hands bound, and they look'd as if they sweated. These cemies they honour'd very much; and when they wanted rain, they say they used to visit them, and they presently had it.

The citation just made from Pane's manuscript mentions both the painting of sacred images on the rock walls of the caves and the carving of spirit images on the stalagmites of the cave floor. A good example of such a "pillar stone" is the columnar figure of a zemi carved from the dome-shape top of a stalagmite at the entrance to the cave occupied by the Museum expedition during its stay in the caves of the south shore of Samaná Bay. The carving is anthropomorphic and has a sinister appearance. Facial features as mouth and eye orbits are represented by transverse lines having upturned joints at their ends. The nose lines are deep and indicate a wide nostrility. This zemi carving is the most massive of any of the stone carvings observed in the caves.

At the entrance to the San Gabriel cave, on the ceiling of the arched entrance vault, is a mazelike series of paintings in black color.

[28] Churchill's Collection of Voyages and Travels, vol. 2, pp. 544, 547.

The series of paintings are fully 20 feet above the cave floor and difficulty must have been experienced by the Indian artist in reaching this section of the cave roof. The painting consists of a series of outer crescentic lines within which are concentric V-shape figures. At one of the outer crescents are several parallel lines forming a series of incomplete V-shape figures. The whole painted design resembles somewhat the triangular incised figures decorating Tainoan pottery vessels (No. 2, pl. 6).

Another maze figure appears within the same cave as the one containing the "pillar stone" zemi. This figure is incised rather than painted and is made up of many parallel incised lines, all of which are broken either at or near the end or at the middle. A short transverse incised line in each case passes from the broken line to the nearest parallel line. A similar maze figure is illustrated by Koch-Gruenberg from the Rio Aiarý of the tropical forest region of northern South America.[29]

Practically without exception the paintings and sculptures on cave walls in Samaná are realistic. The figures previously described are apparently not realistic, although conventionalism in design may have in these instances reached a development where the figures assumed symbolic importance. A purely geometric painting in curvilinear crescentic lines appears on the walls of the "Railroad" cave in one of the more remote galleries where a smooth surface of the limestone walls was available to the primitive artist. Lines are in parallel and appear to represent two crescents facing one another. Parallel line paintings within the area so inclosed make the whole pleasing in effect but entirely unintelligible. (Plate 6, No. 1.)

The realism of remaining figures, both painted and sculptured, from the Samaná caves is striking. Represented are clearly distinguishable forms of bird life, insects, reptiles, fish and shellfish, mammals, and forms of the human figure.

Representations of the human figure appear in realistic and in conventionalized forms. The more simple of these is nothing more than an incised or painted truncated triangle within which are painted or incised two circles or pits representing the eyes. These are united with a downward projecting V-shape line. Legs represented as simple lines extending from the base of the truncated triangle invariably have three transverse lines indicating toes (pl. 6, No. 5).

Another representation of the human figure is in the form of a recumbent oval line inclosing two punctations or pits representing eyes. From the base of this oval representing the head extend two vertical lines representing torso and legs. Base of torso is separated from leg-line extensions with a simple horizontal line. (Plate 6, No. 7.)

[29] Suedamerikanische Felszeichnungen, pl. 4.

A third form of portrayal of the human figure is grotesque. It consists of circular outline representing the head. There is no etched or painted line representing body or limbs. The nose appears as a Y-shape design or as a U figure. Ear forms resembling dog ears are incorporated at the outer circumference of the curvilinear head design, while the mouth is either a short, horizontal line or a recumbent oval. Teeth appear as upright blocked lines. (Plate 13, No. 12.)

A fourth form of portrayal of the human figure is still more conventionalized and consists of an oval figure representing the head. From this there extends a single vertical line representing the body, from which in turn extend angular lines representing flexed arms and legs in various attitudes of rest or motion. This form of presentation of the human figure appears either in painted lines of black color or as line etchings in the rock walls of the caves. (Plate 6, No. 10.)

The lizard is a favorite theme for presentation as an artistic effort in rock painting or sculpturing. The head is always represented as a diamond-shaped figure, while the fore and hind legs in various attitudes of motion diverge from a single horizontal line representing the body, as in the fourth form of depicting the human figure. (Plate 13, No. 16.) The centipede is indicated with the painting of a heavy axial line with several bilaterally divergent transverse lines. (Plate 13, No. 8.) The shark, gar, and several other species of fish, including a barracuda, are painted on the walls of the "Railroad" cave and are excellently proportioned. (Plate 13, Nos. 10, 11.)

The number of species of birds represented by aboriginal paintings on the cave walls of the Samaná area is extensive. Easily recognizable are such forms as owls, herons, cranes, spoonbill, ducks, parrots, along with other forms less realistically executed or representing species now extinct. (Plate 13, Nos. 1–9.)

A painting introducing a religious motive or some other element of aboriginal thought is the painted design of what appears to be a figure of the rising sun, with the figure of a fowl resembling the domestic cock in black appearing in the oval. If the design represents a human figure, then that which might be interpreted as emanating rays of light, if the figure is that of the rising sun, becomes merely a conventional form of headdress. The significance of the bird in the center of the picture is lost with either interpretation (pl. 13, No. 15). Another painted figure represents a bird as standing on top of the head of a human figure. The association of bird forms with those of painted representations of the human figure is not accidental, as in each instance the painting of the two figures

in one design is symmetrical and not extemporaneously conceived. It probably represents a popular form of bird zemi and therefore must be considered as a phase of aboriginal religious painting.

It is significant that no painted or etched form appearing on the smooth rock walls of the caves may be interpreted as at all resembling a mammal form of any description. It is not clear why this should be so, as the middens within the caves where the pictographs and petroglyphs appear contained bones of jutias and of other mammals which made up a portion of the diet of at least the later cave population.

There are two elaborately painted figures of conventionalized human figurines appearing on the walls of the "Railroad" cave that require special mention (pl. 6, Nos. 3–4). They are the most elaborate cave paintings thus far known from any of the islands of the West Indies. Although conventionalized as to arm, leg, hand, and foot design, the technic is intelligible and does not depart widely from details appearing in some of the other paintings representing the human figure. It is in the portrayal of the head, the accompanying ear pendants, and the headdress forms that the novel features of the figurine paintings become most apparent. No figure from any of the known collections of rock inscriptions or rock paintings resemble these paintings. They are therefore interesting in the extreme as peculiar excrescences of Antillean art expressed, so far as is known to the writer, nowhere on pottery designs or elsewhere in art forms from the West Indies.

In general, the resemblance to South American pictographs and petroglyphs as figured by Kock-Gruenberg, Farabee,[30] and others is, if not striking, at least apparent. The resemblance apparently is with that portion of northern South America north of the Amazon River, in Brazil, the Guianas, and Venezuela. One point of difference that at once suggests itself as important is the fact that the South American prototypes occur along the streams, on bowlders, on granitic rocks, in the open savannah, and among the foothills, while those of Samaná appear only on the walls of caves sufficiently smooth and even enough in texture to be adapted for the purpose of such aboriginal pictographic records and artistic efforts. Another point of distinction from the South American area is that the glyphs of the latter area are more varied; that is, offer a greater variety of forms, and introduce many figures executed entirely in a curvilinear design, such as does not occur in the paintings and glyphs from Samaná. Two illustrations of petroglyphs from St. Vincent, in the

[30] Some South American Petroglyphs, Anthropological Essays, in Holmes Anniversary Volume, pp. 88–95. Washington, 1916.

Lesser Antilles, introduce [31] several of the elements of pictographic design previously alluded to in describing the cave pictographs from Samaná. These elements apply only to representations of the human figure and do not at all resemble the more realistic representations of birds and of other objects of natural history, which appear to be a purely endemic form of art characteristic of the cave dwellers of Samaná.

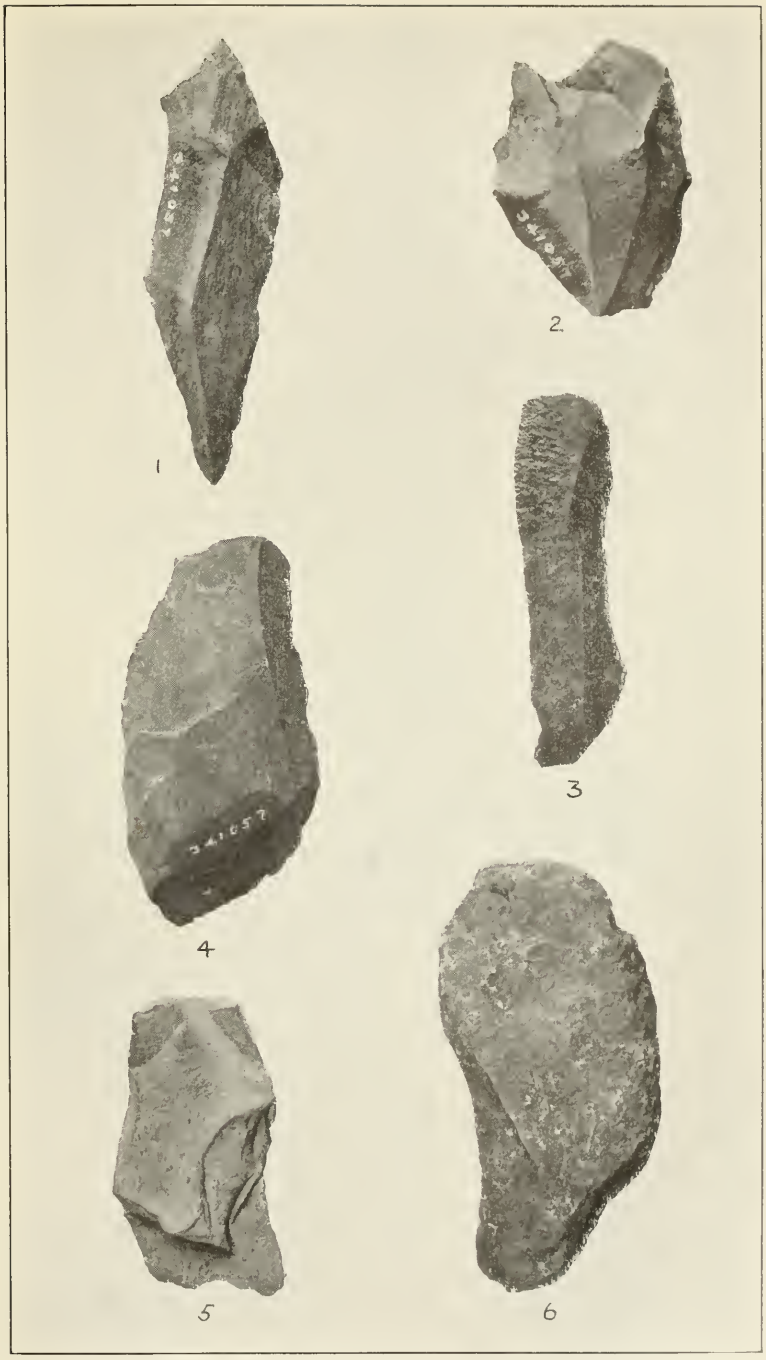
[31] Central American and West Indian Archaeology, by T. A. Joyce, pl. 28.

HAMMERSTONES

FOR EXPLANATION OF PLATE SEE PAGE 64

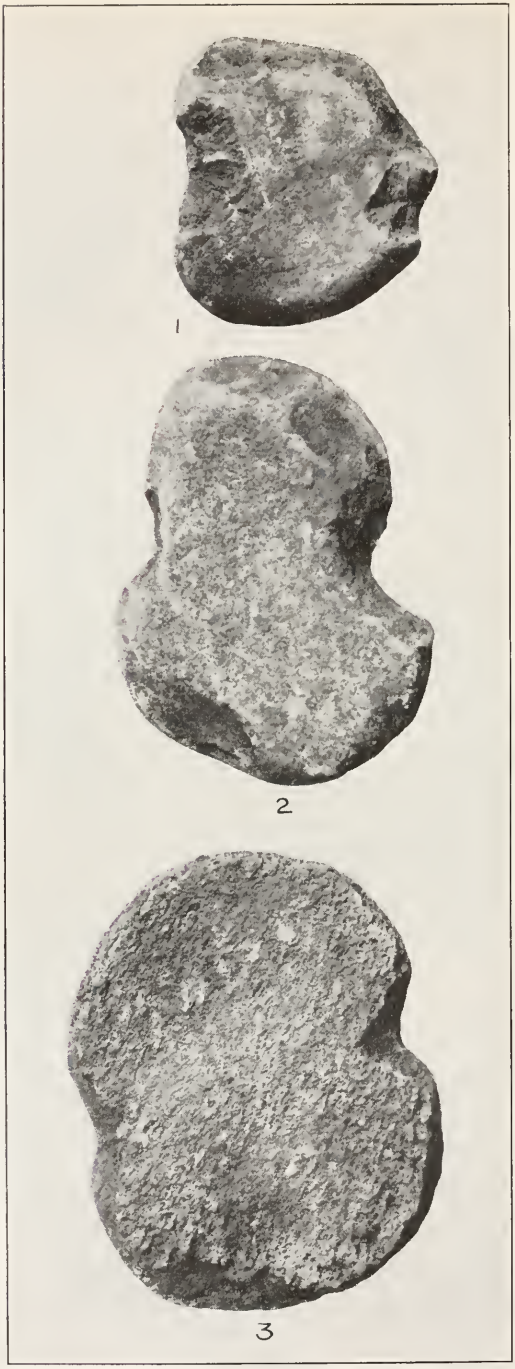
HAMMERSTONES AND NET WEIGHTS

FOR EXPLANATION OF PLATE SEE PAGES 45 AND 64



PERFORATORS AND KNIVES OF FLAKED STONE

FOR EXPLANATION OF PLATE SEE PAGES 66-68



GROOVED STONE IMPLEMENTS AND NOTCHED NET WEIGHTS

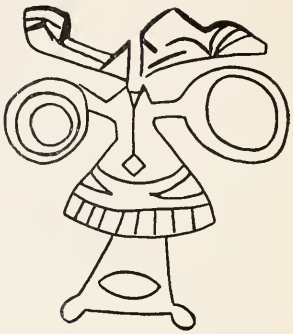
FOR EXPLANATION OF PLATE SEE PAGE 64

STONE CELTS AND PESTLES

FOR EXPLANATION OF PLATE SEE PAGE 62

1

3



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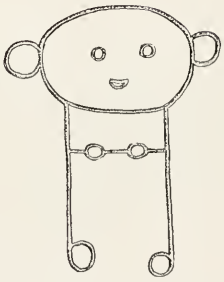

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PICTOGRAPHS AND PETROGLYPHS

FOR EXPLANATION OF PLATE SEE PAGE 87

SHELL DISHES AND BOWLS

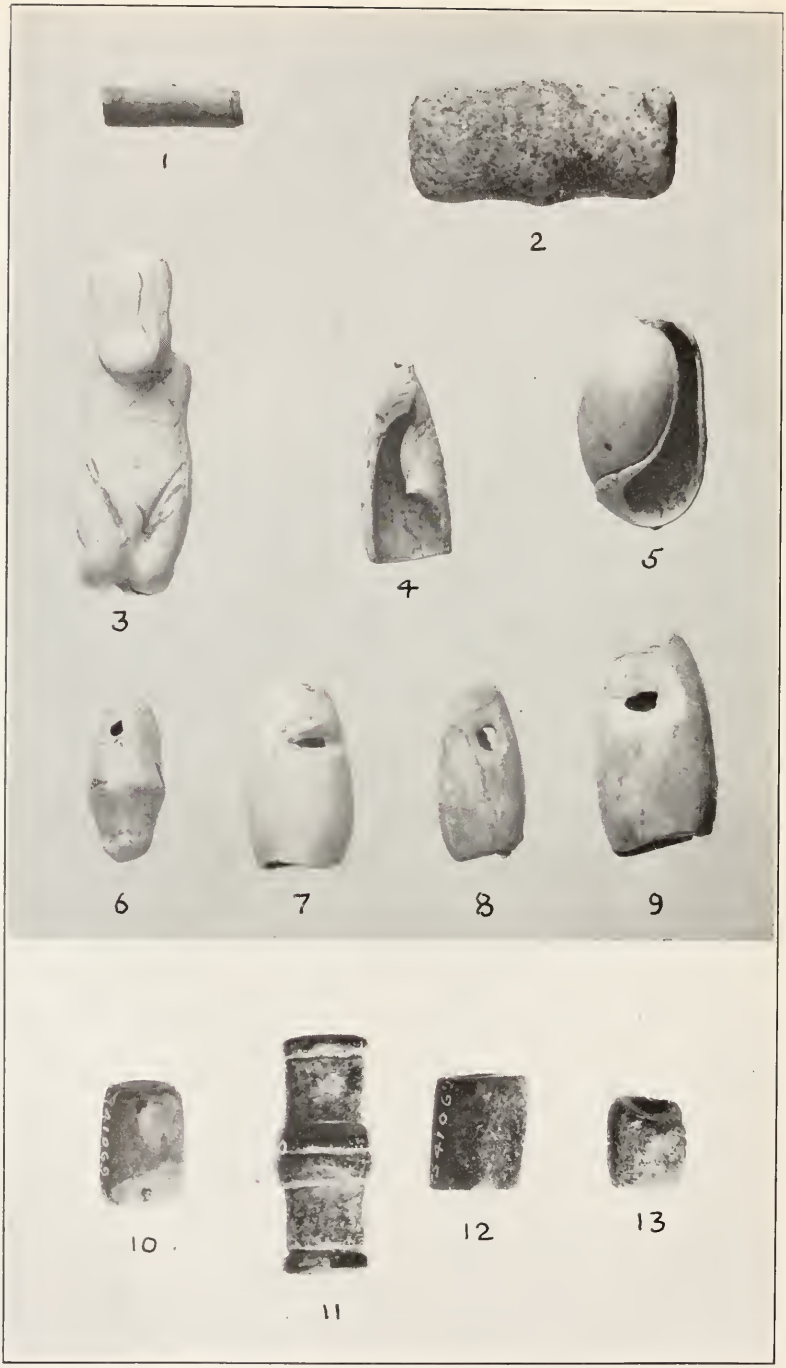
FOR EXPLANATION OF PLATE SEE PAGE 47

GOUGES OF WORKED SHELL

FOR EXPLANATION OF PLATE SEE PAGE 48

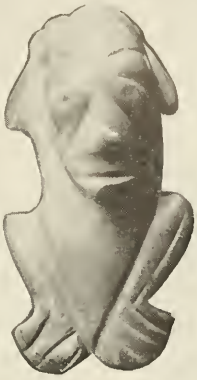
MISCELLANEOUS ARTS IN SHELL

FOR EXPLANATION OF PLATE SEE PAGE 49



BEADS OF SHELL, BONE, AND STONE

FOR EXPLANATION OF PLATE SEE PAGES 50, 71



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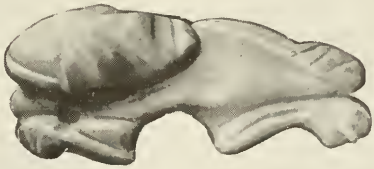

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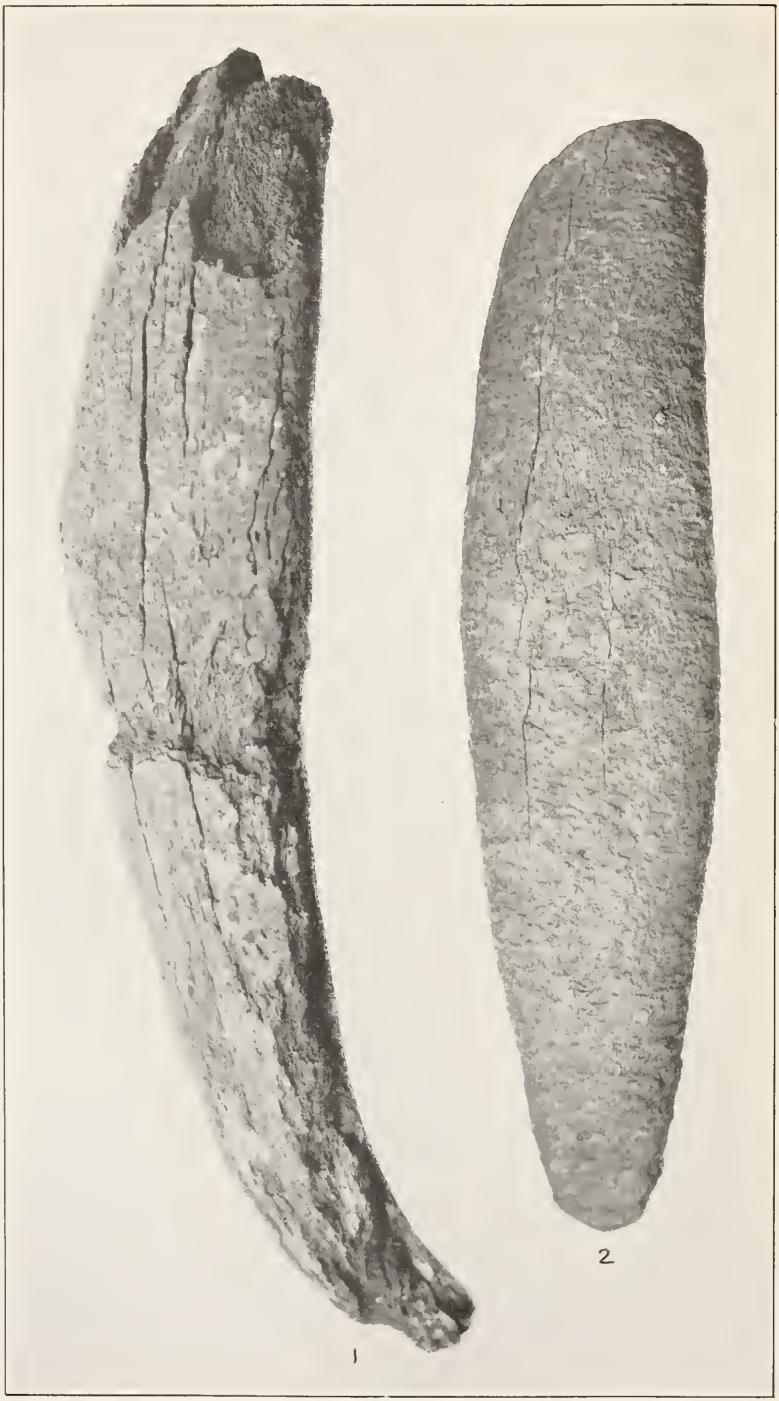
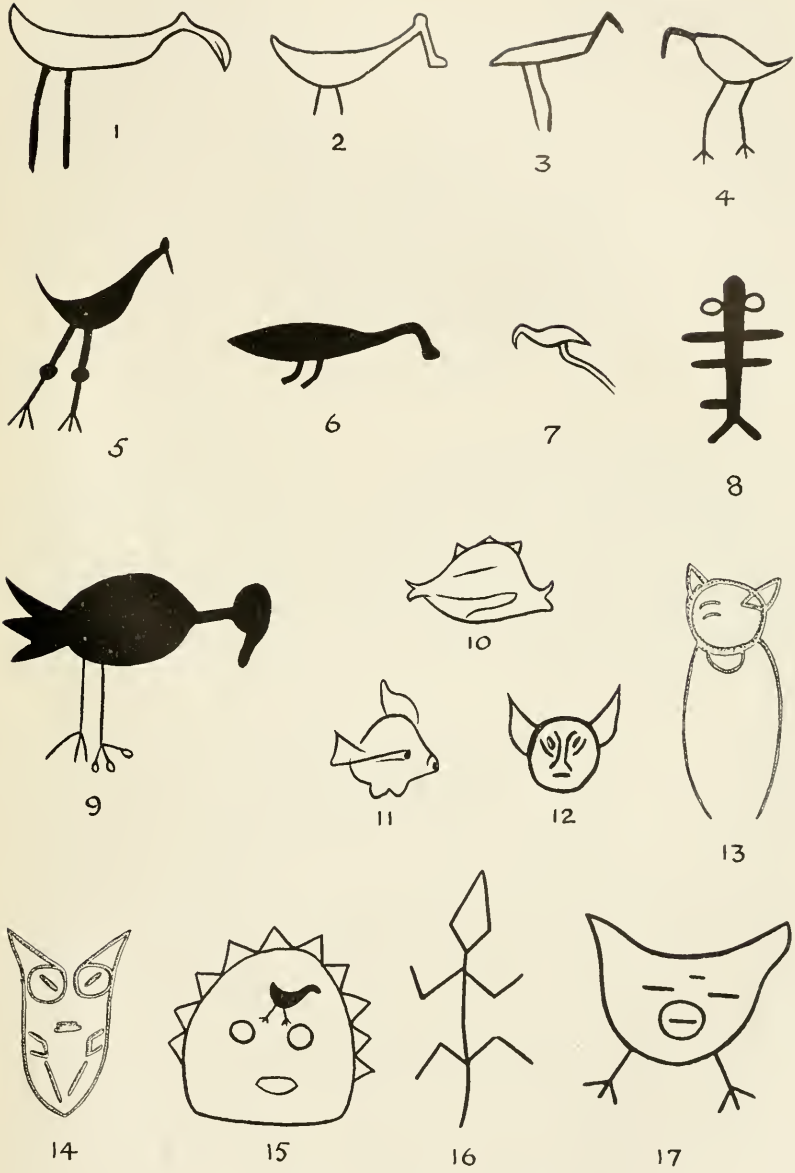
WOOD AND BONE ZEMIS

FOR EXPLANATION OF PLATE SEE PAGE 52



BONE PICKS OF WORKED MANATEE RIBS

FOR EXPLANATION OF PLATE SEE PAGE 51



PICTOGRAPHS AND PETROGLYPHS

FOR EXPLANATION OF PLATE SEE PAGE 89

EARTHENWARE VESSELS

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1 2 3

DECORATED WATER BOTTLES

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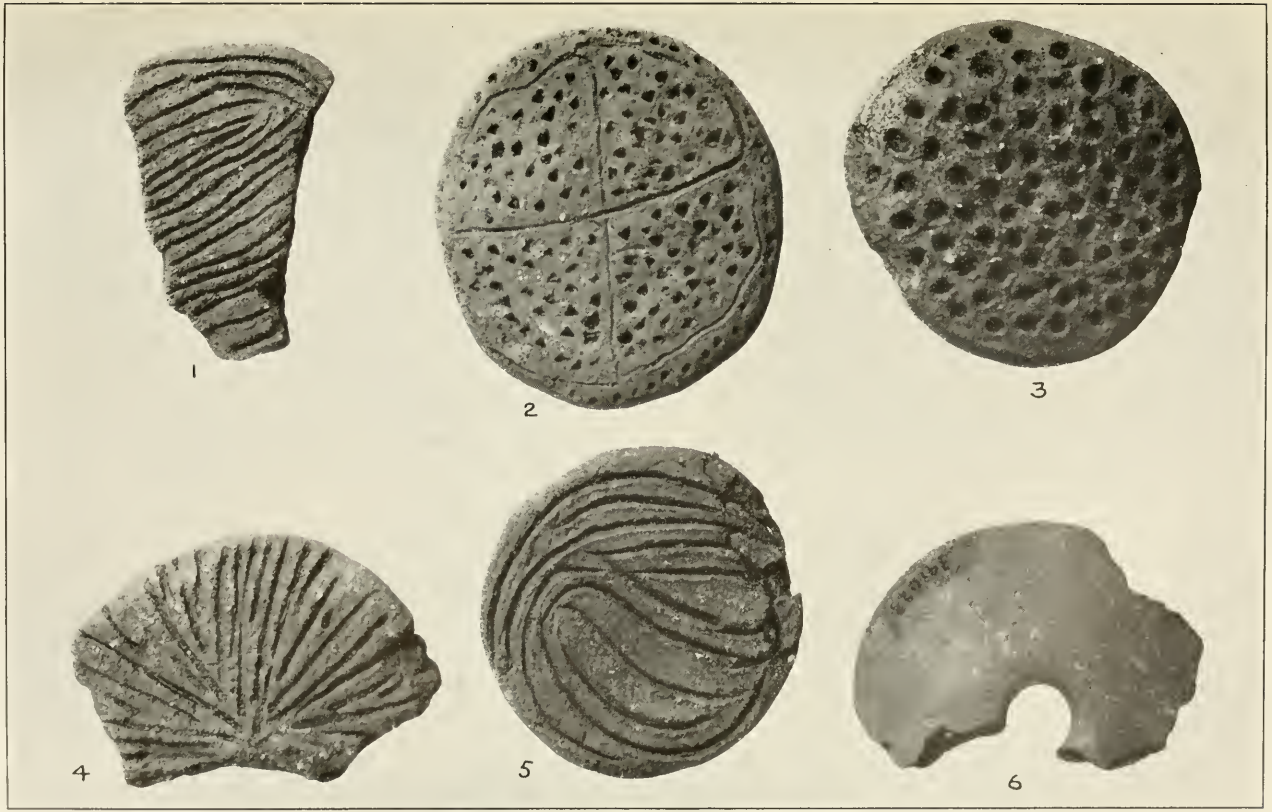
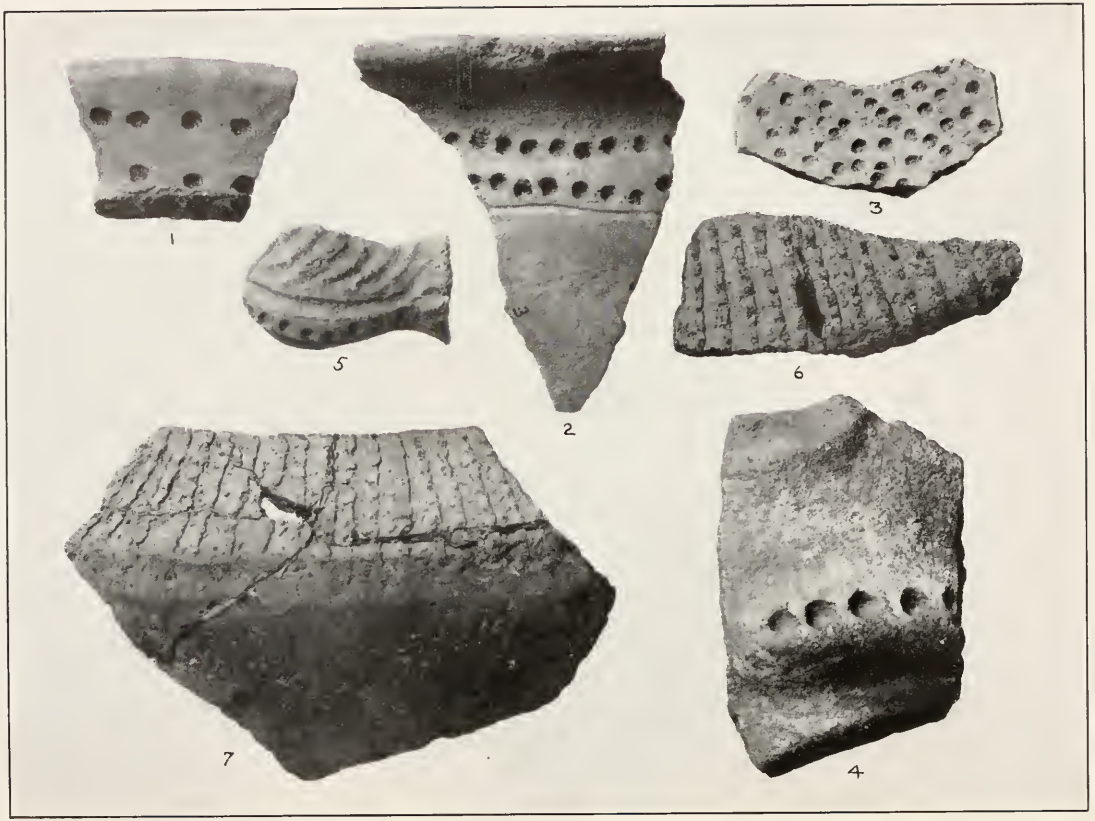
UNUSUAL TYPES OF EFFIGY FIGURINE HEADS

FOR EXPLANATION OF PLATE SEE PAGES 81 AND 83



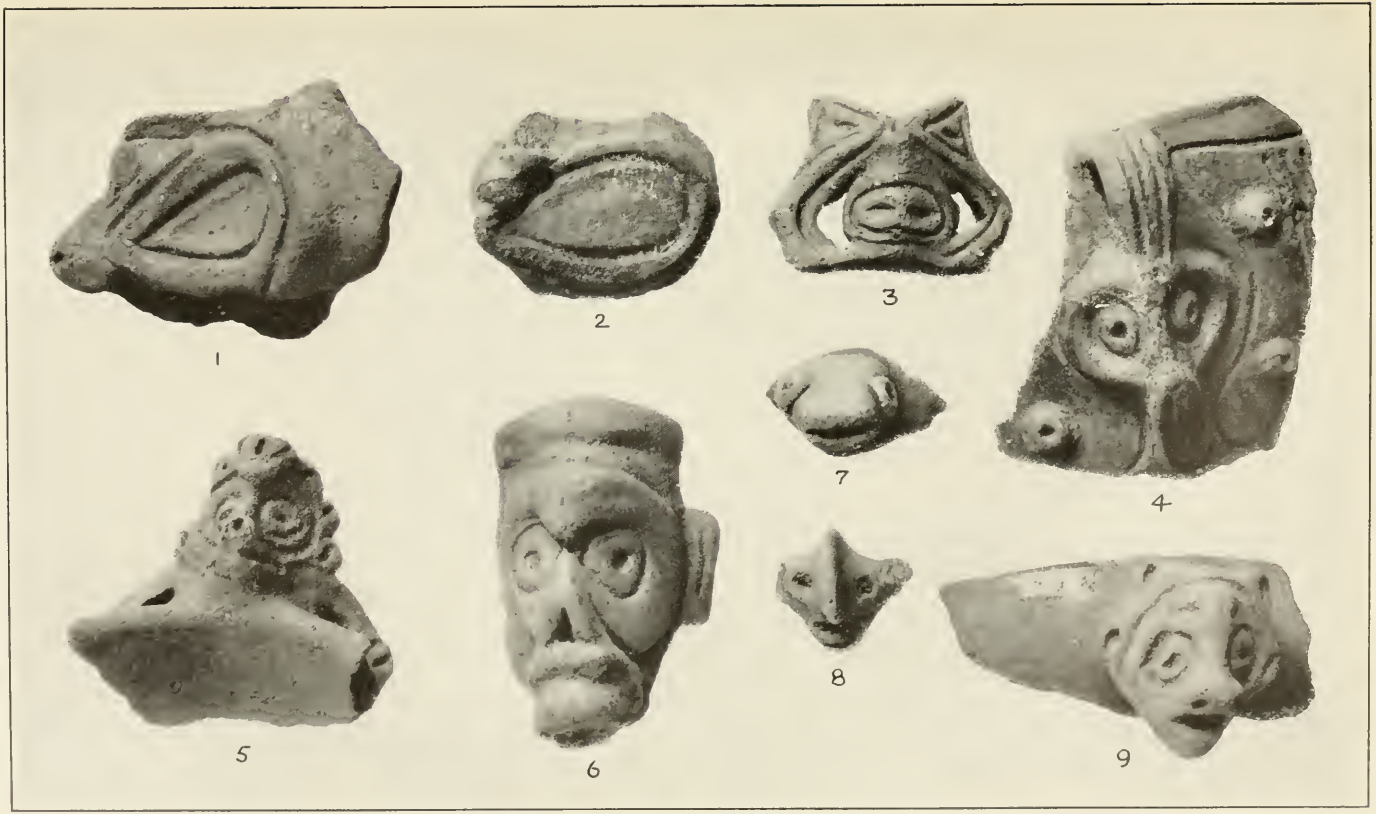
DISCOIDAL POTTERY "STAMPS" AND SPINDLE WHORL

FOR EXPLANATION OF PLATE SEE PAGE 78



PUNCTATE AND CROSSHATCH DECORATIVE EMBELLISHMENTS

FOR EXPLANATION OF PLATE SEE PAGES 79, 80



STONE COLLAR DESIGNS; ANTHROPOMORPHIC AND ZOOMORPHIC FIGURINES

FOR EXPLANATION OF PLATE SEE PAGES 80 AND 85

CONVENTIONALIZED LIFE FORMS ON POTTERY VESSELS

FOR EXPLANATION OF PLATE SEE PAGE 85

CIRCLE AND DOT, CURVILINEAR, AND TERMINAL PUNCTATE DESIGNS

FOR EXPLANATION OF PLATE SEE PAGE 85

RED WARE ZOOMORPHIC FIGURINE HEADS

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CONVENTIONALIZED HANDLES AND LUGS ON SHALLOW BOWLS

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TYPES OF INWARD GAZING FIGURINE HEADS ON SHALLOW BOWLS

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TYPES OF INCORPORATED FIGURINES ON RED WARE

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DECORATIVE HANDLES AND LUGS ON POTTERY VESSELS

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ANTHROPOMORPHIC AND ZOOMORPHIC CLAY FIGURINE HEADS

FOR EXPLANATION OF PLATE SEE PAGE 85

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